REPORT RESUMES

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TEACHERS EDUCATION CONFERENCE, PAPERS FOR PROGRAM ON THE NATURE AND IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION (19TH, JANUARY 19-21, 1966).
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EIGHTEEN PAPERS WERE PRESENTED AT A CONFERENCE ON RESEARCH AND DEVELOPMENT OF EARLY EDUCATIONAL STIMULATION. ALL DEALT WITH EARLY AND CONTINUOUS INTELLECTUAL STIMULATION OF CHILDREN, AGES 3 THROUGH 12. THE PAPERS INCLUDED WERE--(1) INTRODUCTORY COMMENTS, (2) COGNITIVE STRUCTURE AND EARLY LEARNING, (3) OBSERVATIONAL TECHNIQUES FOR APPRAISING DEVELOPMENT, (4) SCHOOLS FOR TOMMORW, (5) PSYCHOLOGICAL SCALING AND EDUCATIONAL RESEARCH, (6) RESEARCH INVOLVING THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN, (7) FINE ARTS, (8) FOREIGN LANGUAGE, (9) LISTENING, (10) MATHEMATICS, (11) PHYSICAL EDUCATION, (12) EARLY READING AND RELATED READINESS, (13) BIBLIOGRAPHY OF TYPES OF ELEMENTARY SCHOOL ORGANIZATIONS, (14) BIBLIOGRAPHY FOR SCIENCE IN CONNECTION WITH EARLY EDUCATIONAL STIMULATION, (15) ANALYSIS AND INTERPRETATION OF RESEARCH, (16) THE STUDY OF LANGUAGE (A MULTIDISCIPLINARY SCIENCE), (17) WRITTEN COMPOSITION, AND (18) CHILD DEVELOPMENT. (AL)

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PAPERS FOR PROGRAM ON THE NATURE AND IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION AT THE 19th TEACHERS EDUCATION CONFERENCE
(1/19/66--1/21/66)

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19th Annual Teacher Education Conference

Introductory Comments: Dr. Warren G. Findley, Director, Research and Development Center in Educational Stimulation, College of Education, University of Georgia

It is a great pleasure to respond to the invitation to make some brief introductory remarks about the Research and Development Center in Educational Stimulation at the University of Georgia and our relation to the program of this Teacher Education Conference on which we are all just now embarking. As you have noted, the theme of the conference is "Implications of Early Educational Stimulation for Teacher Education." The connection is quite direct and natural.

The Research and Development Center in Educational Stimulation at the University of Georgia is one of nine such centers at major universities, supported by the United States Office of Education under the Cooperative Research Program. Each Research and Development Center has its own focus. For instance, at the University of California at Berkeley the emphasis is on problems of higher education, at Wisconsin the focus is on learning theory. The basic hypothesis that unifies the whole program of activities of the Research and Development Center in Educational Stimulation at the University of Georgia is that early and continuous intellectual stimulation of children, ages 3 through 12, through structured sequential learning activities will result in higher levels of ultimate achievement than would otherwise be attained. We are properly interested in compensatory education as reflected in Project Head Start, but we are truly concerned with all children. The educational demands of our modern technological society require that we attempt to teach in the elementary school more of the substantive knowledge previously taught in high school to make room for the explosion of knowledge it is now necessary to teach in high school and college.

A moment ago I referred to the fact that our center is part of a Cooperative Research Program. You have heard of the amounts to be received from the United States Office of Education - some $3.2 million over a period of five years. During this same period the University will contribute $1.8 million in staff time, facilities and services. Over forty professors give research time to the Center, while the five chiefly responsible for administrative direction of activities give from two-thirds to full time.

The organization chart shows the line of authority proceeding from the President of the University through the Vice-President for Research to the Board of Deans to whom the Director of the Center reports. Chaired by Dean Williams of the College of Education, the Board includes the deans of the associated colleges of arts and sciences, home economics, and social work.

Operation of the Research and Development Center is guided by a Management Committee, consisting of the director, the four associate directors, the director of the Social Science Research Institute, Dr. Homer Cooper; Dr. Marion Rice, chief author of the original proposal and one of the principal investigators for the associated curriculum development project in anthropology in the elementary schools, and Dr. James E. Greene, Chairman, Division of Graduate Studies, College of Education. There are four operating divisions that correspond to the broadly conceived functions of the Research and Development Center. Not only is there a division for basic and applied research, headed by Dr. Kathryn Blake, but there is a division for evaluation headed by Dr. Harry Anderson, a division for program development and field testing by Dr. Charles Johnson, and a division of dissemination headed by Dr. Doyne Smith. The Center is concerned, then, with the total process from innovation and basic research through field trial to demonstration and dissemination of effective practices. I might say here that Dr. Smith is at great pains to distinguish his dissemination program from the program of artificial insemination of the Agricultural Extension Service. I should probably add that Dr. Johnson is equally concerned that the field testing done under the aegis of his division not seem to imply treatment of school children as higher-order guinea pigs, so he speaks of cooperating field centers for the conduct of field demonstrations. As you may well appreciate, the distinction reflects a deeper concern that field studies be truly cooperative ventures between school systems and our Center in which planning and operation of studies are undertaken jointly by equally committed partners. Let me pause at this point to pay special tribute to these last two mentioned. Dr. Smith has over the past two years as well as this year been spreading the word of conferences of this sort and their promise of usefulness to you. Dr. Johnson as co-chairman is responsible for the organization and in considerable measure for the content of the conference program.

Just a word or two about the special focus and operation of the Research and Development Center. We early decided that the Center's program would become diffuse and have little cumulative impact if every proposal for a study or activity was supported solely on the basis of its individual merit within the broad field of educational stimulation of children, ages 3 through 12. It seemed equally clear that concentration on a single curriculum area would prevent many persons in other areas from having any part in our program. We chose an intermediate position. We selected language development and the language arts as our area of primary concentration at the start, calling for an integrated design of related studies, but determined to evaluate proposals in other areas solely on their merits as individual studies, allowing the free play of faculty interest to dictate emerging areas for subsequent concentration. The longer chart in your materials shows our prospective expansion over time into successive areas of concentration. The question marks are intended to reflect our flexibility in allowing the areas to emerge naturally. Our interest in studies of the impact of contextual factors of school organization and climate, cultural-social influences, and personal qualities of individual children is shown at the bottom of the chart. Our concern that the increased instructional tempo shall prove compatible with total personality development of children is involved at every point.

Such a program obviously called for exploration of the present status of research and innovative practice in each of the curriculum areas. Which brings us to a major contribution of the Research and Development Center to the program of this conference. Each of the twelve small-group discussions will have as its point of departure a paper and presentation by a faculty member responsible for summarizing studies and programs in one area. Each of you, as a conference participant, has the choice of hearing discussion of three of these papers by chosen specialists, then by the assembled group entire. From this type of exchange, we trust you will gain an efficient rundown on new developments in your chosen areas, while our faculty associates will obtain whatever guidance they need in further refinement of their products for wider dissemination via appropriate publication. We in the Research and Development Center will gain outlines and guides to us and our prospective collabotators in research studies and field investigators as to those topics most needing study and those practices meriting dissemination.

A further word regarding our general approach. The third chart in your materials is designed to illustrate specifically how we propose to extend present practice or findings. In general, it is expected that studies will begin at first grade or age 6. Where possible, of course, the start will be made at kindergarten or age 5, as indicated by the B in parentheses. However that may be, let us assume for illustration that we start a particular cooperative program at first grade only. The first year will involve exploration of the situation for adequacy by criteria such as quality of cooperation available in the school community as well as in the school itself, stability of population, quality of staff, plus analysis of records kept, tests used, and the like. The second year will involve studying practices at first grade level for effectiveness. The third year will involve three actions: (1) following the initial group into second grade with a program designed to build upon their first grade experience, (2) giving the new first grade group a program modified to take advantage of what was learned from the previous first grade's experience, and (3) giving to some if not all the incoming kindergarten group whatever the previous year's experience in first grade suggested might be mastered at an earlier stage. The fourth year and those following will extend the pattern a grade up and a grade down each year until the limits of the nursery school three-year-olds and the sixth grade are reached, respectively. Take the fourth year for illustration. Five groups will be involved: (1) the first group will be followed into third grade with an appropriate offering to supplement the first two years' experiences, (2) the second group of first graders will be followed into second grade and there be given the best adaptation of the previous year's program in second grade, (3) the kindergarten group of the preceding year will have a first-grade curriculum adapted to supplement their kindergarten experience, (4) the new kindergarten group will have a revised offering based on the previous class's successes and failures, (5) a four-year-old nursery school group will be exposed to those experiences suggested by the previous kindergarten year as adaptable to learning at the earlier level.

And now, two items of special interest to many of you. First, we are prepared to consider research proposals from other institutions on equal terms with proposals from those in our own university. Terms of agreement would have to be worked out, but would present no insuperable obstacle.

Second, we shall be able to offer an average of 18 graduate assistantships each year henceforth. These are half-time assistantships, paying $4,000 a calendar year to holders of the bachelor's degree, $4,600 a calendar to those with a master's degree. The magic is that while working half time, the graduate assistant will be able to study two-thirds time. Of course, we are expecting superior students, but it simply means carrying ten quarter hours while working twenty hours a week. Any red-blooded graduate student knows that can be done!

The program discussed in these remarks obviously calls for an ingredient not yet mentioned. Which brings us to the second main contribution of the Research and Development Center to the conference program. Outside consultants especially knowledgeable in what heretofore has generally been pre-school terrain are needed to guide us in charting our approaches. As a part of our dissemination function, we are happy to share four outstanding consultants in this area, beginning with our keynote speaker this evening. Happy hunting!

Athens, Georgia
January 19, 1966.

Cognitive Structure and Early Learning

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A very substantial body of literature has accumulated about the cognitive structure of young adults and its relation to learning. With respect to children, however, systematic information is considerably less satisfactory. We do have knowledge about both sets of variables, cognitive structure on the one side, and learning on the other; but there continues to be a surprising paucity of experimental research which relates one to the other. In this respect, at least, child psychology has lagged behind developments in general experimental psychology. It is becoming commonplace to assess the role of cognitive style, attitudes, and other intrinsic factors in the learning of our favorite subjects, college students, but only a beginning has so far been made to explore systematically the effects of such variables on the learning of children. It is not, therefore, an easy task to deal confidently with the problem to which this paper is devoted.

Two well-known--or at least widely accepted--premises probably contribute to the lack of adequate treatment of early cognitive structure. In the first place, we think of children as lacking such structure and therefore it may be judged difficult to formulate the necessary variables themselves. In the second place, we regard cognitive structure as undergoing basic and continuing change in children, raising further doubts about the variables to be identified. Fortunately, a number of promising leads are appearing which may help to assess the validity of these premises, and thus, open the door to constructive research.

No doubt one's view of the matter depends upon what he means by "cognitive structure." For our purposes, three usages may be identified.

Sometimes it refers primarily to the stimulus-situation. For example, projective-test stimuli may be regarded as less structured than a perceptual-discrimination task. By implication, if not necessarily in fact, the former may be treated as evoking responses which are freer from the effects of cognitive structure than the latter. I say not necessarily in fact, because the less structured situation may by its very character impose fewer realistic demands upon the person and thus actually call quite directly upon the operation of cognitive structure, defined as intrinsic intellectual characteristics. At any rate, we can recognize that task properties do influence cognitive organizing processes and therefore must be taken into account. Perhaps we should call this first usage "cognitive structuring", with emphasis upon the imposition of certain demands upon the individual. From this standpoint, it is plain that learning can be studied in tasks that differ in their degree of structure. Some of the work to be examined bears upon this aspect of the problem.

In a second usage, cognitive structure refers to the general functioning of human thinking. Thus, we may speak about intellectual abilities and about various kinds or stages of conceptual or problem-solving activity. For example, we often refer, generally, following Piaget, to egocentric characteristics of children's thinking, or to global and analytic stages of intellectual development (L'Abate, 1962). This treatment implies, on the one hand, that there are differentiated cognitive functions which determine performance under appropriate conditions in rather predictable ways. This viewpoint implies, on the other hand, that there are quite consistent and general progressions in the emergence and organization of intellectual abilities from infancy to adulthood. In either case, we can imagine the psychologist cutting a cross-section through the human mind and by suitable staining methods, revealing its structural components and their relation to each other within the whole system. We can borrow Guilford's (1960) concept of the "structure of intellect" for this second usage. In his analysis, cognitive structure becomes a matter of contents, operations, and products, each with its separate factors. Operations, for example, are organized as distinguishable processes of evaluation, convergent production, divergent production, memory, and cognition. This conception rests on the assumption that cognitive structure characterizes all human beings and in generally the same fashion. Clearly, we can relate the hypothesized variables to learning. For example, we can compare the rate of learning in tasks that call upon memory with others that demand divergent thinking. We can go a step farther and employ tests, like those developed by Guilford, to measure any of the factors. After that, we can choose any task we wish, and then compare individuals who make high scores--who are, for instance, good on divergent thinking--with those who make low scores.

Finally, cognitive structure may refer to the inferred intrinsic properties of a person, as these can meaningfully be regarded as pertinent to cognitive performance. These properties concern the special ways in which persons deal with objects and tasks. We need not fall into the trap of dismissing this third view of cognitive structure as insisting upon the irrelevant idiosyncrasies of personal development. Rather, we can identify variables which result from certain kinds of experience in interaction with motivational and attitudinal dispositions. Thus, we might say that they cut across the ability factors just mentioned, and represent conditions that determine how abilities are used. If abilities group themselves into factors, as Guilford proposes, but the factors are present in everyone, then cognitive structures, in this third sense, group persons together into categories. That is, a cognitive structure states similarities among individuals, who, as a class, are different in this respect from other individuals. This means that we would look, as R. S. Woodworth once put it, at how people form concepts or solve problems, as much as at the level of performance attained. Of course, by following this advice we may well reach a definition of variables which will enable us to predict achievement, and thus perhaps simply add to the picture of abilities. The term "cognitive style", as employed by Gardner, Holzman, Klein, Linton, and Spence (1959), is suitable for this third usage. The substance of this paper is mainly concerned with this type of variable.

I shall first examine the general question of cognitive structure in children, together with developmental aspects thereof. Then I shall try to assess how such variables may be related to early learning. For my purposes, "early learning" will have a rather general reference, extending from about the pre-school period on into the elementary-school years. Finally, I shall discuss possible implications of cognitive structure in earlier periods for learning in later years. I shall emphasize current research. Space is too limited to do justice to the background out of which present ideas have grown.

Development of Cognitive Structure

In this discussion, I shall omit reference to psychoanalytic conceptions of changing cognitive structure, because the pertinent experimental research has mostly grown out of other approaches. In general, there does no appear to be any fundamental discrepancy between notions of the progressive role of the reality principle and of the establishment of ego-structure, and the broad principles that characterize other treatments. However, because of the lack of communication between advocates of psychoanalytic and experimental approaches, accompanied for the most part by emphasis on different variables, it is convenient in a limited paper to focus on one type of type of treatment. It would take us too far afield to disentangle and re-order the pertinent concepts.

1. Trend towards logical and conceptual thinking. Piaget has supplied us with an inclusive framework for the kinds of change that take place in the school years (a convenient summary has recently been provided by Berlyne, 1957). By the time the child has reached pre-school, he has passed through sensori-motor and preconceptual phases, which represent the acquisition of primitive intellectual skills. He has learned to recognize objects and to treat them as having existence independent of himself. He has begun to develop symbolic functions, for example by naming objects and recognizing them when they reappear. He has "pre-concepts" by which he can relate one object to another of the same kind, but without true classifications. We can say that the child's thinking is closely determined by perception, so that he cannot deal with objects by means of general relationships or properties. He tends to reason by particulars--one is tempted to say, by association between objects as a function of immediate personal experiences with them.

By the pre-school years, the child has entered into a period of "intuitive thought". There is still a strong dominance of perception; that is, he believes what he sees, rather than being able to generalize on the basis of fact. In a sense, this means that he does not discriminate easily between the diverse manifestations of the same object. If we place a number of beads in a glass container, and then transfer them to a taller, thinner container, the child is likely to say that there are more or fewer beads (depending upon whether he stresses height or thickness). He does not separate the number from the appearance of the container. In the next stage, that of concrete operations, between the ages of about 7 to 11, true logical concepts become established. Now the child can form classes, infer relationships and kinds of order between and among objects, and thus deal with objects independently of the objects themselves. At this point, then, he has developed considerable freedom from the specific properties of stimuli, and has acquired skill in symbolic and logical manipulations. Finally, during the teens, the individual typically passes into the period of formal operations, or advanced abstract thinking. He can combine, arrange, evaluate, systematize general statements by using a "propositional calculus." He can formulate hypotheses, entertain complex ideas made up of relations among several contrasting properties, criticize, examine implications, and explore the possibilities when facts are combined in a variety of possible ways.

To sum up, we can say that the Piaget analysis pictures a general progression from pre-logical, self-centered, perceptually determined cognition to logical, symbolic, abstract, and propositional reasoning. Especially critical focal points enter at about age seven with a shift towards true concepts and their usage, and at about age eleven with a shift toward abstract manipulation of concepts.

The general view of Piaget has been well-supported in research (e.g., Elkind, 1961; Goodnow, 1962). And Bruner (1964) describes intellectual development in similar terms. Experiments derived from mediation theory, like those by the Kendlers (1962) on reversal shift, fit in with the notion of critical ages. In this kind of experiment, we present the subject with two pairs of stimuli, say a large black square with a small white square and a large white square with a small black square. He is expected to learn that large figures are correct, and small ones incorrect. After this concept is mastered, we introduce a change. Now, the opposite is true, because small figures are correct, large ones incorrect. This condition is called a "reversal shift". But we can also change the concept itself, by requiring, in the second task, that "black" figures be correct. This is called a "non-reversal" shift. Very young children (like rats) learn more readily the non-reversal shift, whereas reversal shift is easier for children beyond the pre-school age. This finding indicaties that a mediating response--i.e., the concept learned earlier--operates more strongly in the older children, whereas younger children treat the new concept (in non-reversal shift) very similarly to the first one. The boundary age corresponds closely with that between preconceptual and conceptual stages in Piaget's formulation. It should be noted that age is not the only consideration, for faster learners resemble older subjects.

This latter point indicates the limitations of the Piaget approach for our problem. Indeed, it belongs more under our second type of conception--the structure of intellect--than our third--cognitive structure.

Cognitive structure in the Piaget view, seems to be a matter of rather regular and inevitably unfolding characteristics. It allows little for individual differences, although perhaps recognizing incomplete passage from one period to the next. Rather, Piaget appears to give us a general model for human reasoning, just as Guilford does, as if the kind and level of performance in intellectual tasks were primarily a function of the age (either mental and chronological, or both) at which we introduce them. Of course, we all know that there is some truth in this view, but it is far from the whole story. For example, we should like to know whether particular programs of training, teaching, and reward may alter the course of development, either changing its rate or altering the mode of reasoning itself. These possibilities have been revealed in a variety of research, as we shall see.

2. Trend towards Field-Independence. Changes with age have also been described as the growth of analytic attitudes, or field-independence. Here, the well-known studies by Witkin and his associates (1954) are expecially pertinent. In a series of ingenious situations, these investigators have shown that children under the age of 10 are typically influenced strongly by the structure of the visual field. That is, they are "field-dependent". For example, they have difficulty in distinguishing between visual and non-visual cues, and thus do not adequately correct for tilted body posture when visual reference points are apparently vertical. In the "embedded figures" task, similarly, they have difficulty in identifying the concealed figure. These tendencies are greater in females than in males.

There is a marked change towards field-independence between the ages of 10 and 13. At this time, also, there is a shift in the direction of greater organizational control in miniature play situations. However, other studies (Kagan, Resman, Day, Albert, and Phillips, 1964; L'Abate, 1962) reveal an increase in analytic attitudes at still earlier ages, beginning at about age seven. Trends of this sort, then, are apparent over a considerable age-range.

For our purposes, the Witkin studies are especially important in leading to the notion of general cognitive styles. Even adults display contrasting field-independent and field-dependent characteristics; furthermore, these are correlated with a variety of other traits, including control over impulses, and activity in coping with tasks. Thus, we have a lead towards investigating the relation between cognitive structure, in our third sense, and learning.

3. Trend towards Increased Inference. The Kendlers (1956, 1962) have also studied the solution of problems that require the subject to integrate previously learned responses in order to proceed directly to a goal. Inferential behavior of this sort increases markedly during the early school years. Along the same lines, Osler and her associates (1961, 1962) have found improved problem solving between the ages of 6 and 14, as a function of increasing hypothesis-forming and -testing. (See, also, Weir, 1964). Differences between superior and average children suggest that age is not the only factor responsible for the change, so that we must consider further implications of this trend for early learning.

4. Trends in the Use of Language. Out of the wealth of research on children's verbal responses, only a few points need be mentioned in the present context. Several studies show that young children display rapid and personalized free association responses. With increasing age, contiguity between verbal stimuli and responses stabilizes (Davidon and Longo, 1960; Donahoe, 1961; Ervin and Foster, 1960). Put another way, connotative meaning gives way to denotative meaning; about the age of nine, denotation appears to become dominant. Another way to describe this trend is to say that during the early school years, children learn to use words in more conventionalized and differentiated ways (Werner and Kaplan, 1950). There is a shift from expressive and individual usages to more abstract and symbolic usages. As Martin (1951) puts it, there is not only the familiar increase in vocabulary, but just as important--or even more important insofar as problem solving and conceptualizing are concerned--versatility in use of words increases. This signifies that language-development facilitates an awareness of concepts and improves the child's ability to

manipulate them. As a consequence, there arise important implications for the efficiency of learning and for the conditions under which methods of teaching can influence the learning process.

We have, then, a variety of notions about the characteristics of cognitive structure in the early years, together with indications about how they change with age. Some of these ideas concern basic, general abilities and their status at various ages. Other points suggest that kinds or patterns of learning varies with the kind or pattern of cognitive structure in the pupil. It is time now to consider the relation between such possible structure and learning processes. The question is, can the course of learning be changed by influencing cognitive structure, or does learning demand a close approximation between conditions of instruction and the age (and/or estimated ability) of the student?

Effects of Cognitive Structure on Early Learning

Research that bears directly upon relations between the cognitive structure of children and learning falls naturally into three categories. In the first place, a few studies attempt to assess the effects of differences in cognitive style and related variables. In the second place, training conditions are treated as experimental variables. Finally, a variety of intrinsic and situational variables have received attention. It will be convenient to look at the problem from these three points of view.

Cognitive Structure as a Variable. Although considerable progress in the definition and experimental treatment of conceptual and attitudinal properties is apparent at the adult level, this approach is surprisingly meager when it comes to children. This statement is based on a rather narrow framework in the present context, since it refers to cognitive style, and therefore signifies that our concern is only with individual differences in intrinsic properties that may be regarded as directly pertinent to such complex learning as concept formation and problem solving. Thus, I am excluding, for the most part, the literature on intellectual abilities, as measured by intelligence tests, the work on broadly defined attitudes such as are implied in measures of parent-child relationships, etc. In short, we might say that my orientation is towards children as they are normally found in classroom-learning situations. In this respect, there is a good deal of research comparing "fast" with "slow" learners. I shall not refer explicitly to this work, either, in the interests of considering more clearly defined concepts of cognitive structure.

The concept of category width, developed by Pettigrew (1958), has been applied by Wallach and Caron (1959) to sixth grade children. As its name implies, this variable concerns how broadly a criterion is used in classifying events or objects. A wide categorizer is willing to include a considerable range within the same concept, whereas a narrow categorizer limits the range. This difference suggests that wide categorizers tolerate risk in forming judgments, whereas narrow categorizers are quite conservative. Females tend to be narrower categorizers than males. Wallach and Caron first conducted a concept-learning task. Half of the subjects categorized on the basis of Criterion A, the other half on the basis of Criterion C. However, there were also present a number of other, noncriterial cues. All the stimuli presented to each group further contained the property which was criterial for the other group. Next, the subjects were given a similarity test, in which the stimuli varied on Criterion A, but were all alike on other criteria, including Criterion C. The task was to identify the stimuli that could be given the name learned in the first phase. Two noteworthy results occurred. In the first place, subjects trained on Criterion A were significantly more strict in judging similarity--i.e., adopted a narrower definition of the category. In the second place, females were narrower than males under all conditions. The first finding indicates that category width in a particular conceptual task depends upon how explicitly the definition is learned; the second finding shows that the antecedent cognitive structure of the learner is an important determinant both of what is learned and how it is applied in new situations. Like many experiments of this kind, however, this one poses certain dilemmas. Do we want students to be narrow categorizers (and thus possible more exact and careful) or to be wide categorizers (and thus possibly more flexible, abstract, and intellectually daring)? Clearly, we can see important relations between intellectual characteristics and learning, but we cannot, as yet, assess all the implications.

Amster (1965) brings out similar points in her studies of cognitive styles in college students. Subjects low in interference-proneness--i.e., susceptibility to influence by distracting or conflicting cues--perform better with an intentional set, but do worse with an incidental set. Subjects who are highly verbal also do better under intentional set, but subjects who are low in verbal skill are not affected by task conditions. These distinctions appear to represent a difference between persons who behave more conceptually and those who behave more perceptually.

It would be interesting to study children from this point-of-view, since it suggests that differences in rate of learning depend to some degree on how tasks are presented to children with differing cognitive styles. A result that bears on this point comes from experiments by Osler and her associates (Osler and Fivel, 1961, Osler and Trautman, 1961, and Osler and Weiss, 1962). They find that children of superior intelligence solve problems by looking for and testing hypotheses and, in so doing, more often arrive at "sudden" insightful solutions, compared to average children. However, in routine and concrete situations, superior children lose their advantage by continuing to employ what is now an inappropriate strategy. The strategy of average children, which is marked by stimulus-response association, leading to gradual solutions, is better under some conditions. Research of this kind, then, suggests a need to program learning at a higher level than that represented by specific tasks. We ought to teach youngsters about strategy itself and how to adapt it to the task. Superior children need to recognize the pertinence of gradual association under some conditions, just as average children need to be instructed in more complex, inferential strategies. According to Weir's (1964) results, there is a shift from stereotyped strategies, typical of children under 15, to complex hypothesis-forming strategies, typical of adults.

Other clues to the significance of cognitive styles come from studies of open versus closed-mindedness in college students (Restle, Andrews, and Rokeach, 1964). The open-minded subject searches for principles even when none is required, and therefore does poorly on routine, associative tasks; the closed-minded subject passively follows instructions, and therefore does poorly on inferential, insightful kinds of problems.

The relation of strategy to type of task is revealed in a number of experiments, including those by Bruner, Goodnow, and Austin (1956), Goldner (1957), and Sieber and Lanzetta (1964). These studies, conducted with college students, reinforce the points with which I am concerned, namely, that there are individual differences in preferred strategy, and that the quality of learning depends upon the kind of strategy adopted. I am convinced that we can instruct children in strategy and teach them to adapt their approach to the character of the problem with which they are faced. In some instances, at least, children who manifest a differentiated attack are especially successful (Martin, 1951). Training in strategy and its application may represent a significant step beyond concepts of mere versatility. Here there appears an extremely interesting and promising avenue for research.

Training. Let me turn now to some of the results associated with the conditions under which learning takes place. I can make these points rater quickly.

It has been found in a variety of studies that pre-training in responses facilitates learning in later tasks. Put in this way, of course, it sounds like a truism. Looking a little more deeply, some less obvious implications emerge. Thus, it becomes apparent that we need not regard learning simply as a function of the child as we find him (as is implied in the notion of specific stages and abilities). We can speed up and diversify learning by appropriate preparation. Beyond that, we can get away from the widespread tactic of studying learning in specific, isolated tasks, and move in the direction of investigating sequences of learning.

For example, the "acquired distinctiveness of cues" (Spiker, 1963) is an important factor in conceptual learning. In this kind of training, pre-school or first-grade children may first be given an opportunity to learn the names of stimulus objects before they are placed in the learning situation. This initial experience significantly improves the learning of concepts involving objects of those kinds. Tighe (1965) has shown that pre-training in the discrimination of stimulus-dimensions greatly improves the learning of the reversal-shift problem mentioned above. Youniss and

Furth (1965) demonstrate the same effect (with "overtraining") for first-graders. Dietze (1955) shows that clearly differentiated names bring about faster learning than less discriminable names. In tests of some of Piaget's conclusions, Estes (1956) indicates that ability to form concepts depends upon whether or not the child possesses initially the requisite skill. For example, if he could count accurately, he did not confuse number with arrangement of stimuli; if he could project a straight line in one direction, he could do so in another. With college students, Maltzman and his associates (1960) have shown that training in the production of unusual associations increases the originality of response.

Therefore, it would appear that what a child brings into a situation has important effects on how well he learns. This conclusion should not surprise anyone. I suspect that the cave-man knew very well that he ought to teach his son about bows and arrows and the habits of animals before sending him out to hunt for the family. But unfortunately it isn't easy to decide which skills to teach for which task, nor, more importantly, perhaps, how to teach those skills. There is now considerable evidence that "learning sets" enter the learning situation after the age of six (Reese, 1963), and that the acquisition of such sets facilitates the learning of related problems. But there are both specific sets that work well in a narrow range of situations and more general modes of attack that have to [illegible] with problem-finding and adapting strategy to the character of the problem. Sometimes we employ terms like "rigidity" and "flexibility" to stress the difference.

Especially enlightening are studies that have compared memorization with "understanding" approaches (Saugstad, 1952, 1957, Forgus and Schwartz, 1957; Gagne and Brown, 1961). Borrowing from Katona (1940), Duncker (1945) and Wertheimer (1959), investigators have shown that children, as well as adults, solve problems more readily when stress is placed upon the search for, and discovery of principles, than when practice conditions lead to specific part-learning and memory for details. In fact, memorization actually hinders learning when principles are involved. This point agrees with the findings on differences in cognitive structure mentioned above. It adds to the evidence that training influences the cognitive structures that operate in learning situations.

The manner in which the situation is treated also affects learning. Even when principles are involved, the process of solution can be speeded up by requiring children to verbalize as they work. Gagne' and Smith (1962) suggest that this has "the effect of making them think of new reasons for their moves and thus facilitates both the discovery of general principles and their employment in solving successive problems." However, sheer verbalization is only part of the story, for children who produce relevant comments do significantly better than those whose remarks are irrelevant (Kendler, 1963). Thus, training to solve problems has a variety of dimensions, each worth careful attention. We can teach children to discover principles, to verbalize while they work, and to strive for relevant aspects of the problem.

Undoubtedly we could pursue at great length the many ways in which training influences cognitive style and its relation to learning. We have not even considered broader issues of how the richness and variety of background affects learning (Findlay and McGuire, 1957; Siller, 1957; Smith and Roth, 1960), but rather have illustrated the point by reference to a few specific studies. We can well agree with Fowler (1962), who has recently presented a detailed review of these issues. He concludes that children can learn more, and at an earlier age, than we commonly suppose. He points to the importance of cognitive style and its influence by teaching procedures. In all of these respects, we lack adequate research.

Other Factors in Early Learning. Research on concept formation in college students has explored a large number of factors that affect the rate and quality of learning. However, very few comparable studies are available with children. Although we can suppose that the same general conclusions probably hold true for younger subjects, nevertheless, confirmation is lacking. Beyond that, we need information about various special conditions that may qualify the conceptual learning of children, like those associated with language development, the effects of special rewards and instructions, and the relation between experimenter (or teacher) and the child subject.

Suggestive findings with older subjects fall into the following areas:

1. Variations in the task. In general, any condition that increases the difficulty of discriminating the correct cues interferes with the attainment of concepts. Such conditions include variability in dimensions of the concept (Battig and Bourne, 1961), rendering the stimuli more complex, giving misinformation (Bourne, 1963; Johannsen, 1962; Neisser & Weene, 1962), and introducing irrelevant cues (Johannsen, 1962; Peterson, 1962). However, it is not necessarily a good solution to make the task extremely simple and straightforward (especially for people of superior intelligence, as pointed out above). Both adequate feedback (Bourne & Bunderson, 1963) and sharply differentiating irrelevant from relevant cues (Kendler & Karasik, 1958; Archer, 1962) result in improved performance in complex tasks. It is an important issue whether learning ultimately benefits more from

simplifying the task or from modes of presentation which foster clear discrimination of relevant features. I am thinking, here, of the same kind of task, not two different tasks which call upon different functions.

2. Personal involvement. Material which requires active participation in the learning process is most readily learned, other things being equal. This condition is approached by tailoring material to the interests and knowledge of the subject (Fallon and Battig, 1964), by having the subject manipulate the material (Davidon, 1952), or by instructions to think and to engage in active search (Podell, 1958). Asking for verbalization, mentioned above, is a technique that works in the same direction. The provision of reward at strategic points in the learning sequence improves learning, as shown in inference problems (Kendler, et. al., 1958), as well as in conceptual learning (Grant & Cost, 1954).

3. Motivational variables. Here, again, experimental psychology has opened up many clues to the facilitation of learning (Vinacke, 1962). Except for a few studies with anxiety, however, these findings have not been extensively applied to children. One exception is work on social reinforcement (Gewirtz and Baer, 1958; Bandura, 1962), in which motivational states appear as significant factors in learning. Sontag and Baker (1958) have revealed significant correlations between motives and IQ changes during the school-years, and other studies show the adverse effects of emotional problems (Nass, 1956). The kind of study that is needed, however, is represented by the research of McKeachie (1961) at the college level. For example, he shows that students high in affiliation receive higher grades when the teacher manifests "warmth" than under other conditions. Similarly, men high in achievement make lower grades in classes which provide few achievement cues, whereas women perform at a higher level

under this condition. Such studies clearly show the effects of motivational (and other personality) characteristics on learning.

Probably, these results do not come as a great surprise to teachers. They know that some methods work better with some children than with others. However, this principle usually operates at an intuitive level and is exceedingly difficult to put into practice. Research is required to tease out the lines along which it can be carried out. We are left with the general principle of relevance, which can be stated, as follows: Performance reaches its maximum under conditions when the task and its associated rewards are best suited to the motives and interests of the person. This principle is contrary to the idea that there is a "best" method for inducing maximum performance. There is no one effective reward, no uniquely successful set of task-conditions, no uniformly superior teaching procedure. It may be worthwhile to adopt the best practice available (or known), but this will produce maximal performance only from those individuals for whom it has special relevance. Clearly, we really know comparatively little about this matter.

Early Learning and Later Learning. Originally, I had intended to extend my remarks to the issue of preparation for the situations which confront the individual in high school, college, and adulthood. But, since I have already taken up so much time, I must be quite brief.

These are two problems in early learning. On the one hand, we are quite legitimately concerned with the conditions that inhibit and facilitate learning at that period. However, a more important question concerns the kind of preparation that early learning provides for later learning. It could very well be that certain cognitive structures and conditions of instruction are very favorable for the tasks in elementary school, but are distinctly less advantageous for tasks in later years. Creativity is a case in point. Without going into detail, I can point to extensive work in recent years (Getzels and Jackson, 1962; Taylor, 1964) that shows how inhibiting for creative thought much of the usual classroom procedure can be. It depends, of course, upon one's aims. Fostering creativity is one objective; producing good grades is another. I do not maintain that these objectives are incompatible, but only that different conditions of learning are involved. The same may be said for other aspects of intellectual growth as well. I pointed out above that relations between method of attack and kind of task have much to do with the level of performance manifested by a person. Memorizing and concrete approaches to problems work very well in some tasks, but interfere with those which involve hypothesis-forming and -testing, discovery of principles, and abstract reasoning. Again, I do not maintain that one sort of cognitive style is superior to the other, but rather that each has implications for effective performance under certain conditions. I would argue that training which emphasizes the development of particular cognitive styles, whether or not it suits the apparant needs of the child, may have highly significant consequence for later learning. In short, the issue is not only one of the relation between cognitive style and early learning, but also one of the establishment of enduring cognitive styles themselves. There is not space to pursue this issue further, but I must emphasize its importance.

Summary

Let me try to bring together, now, the salient points that appear in this grossly inadequate survey of the problem. I have endeavored to differentiate cognitive structure (or cognitive style) as a characteristic of the learner, from task structure, and from intellectual abilities as they are viewed in factor analytic approaches. To be sure, these three kinds of variables are not independent of each other. For example, task structure imposes conditions on the learner, regardless of his cognitive style; persons who are high in certain abilities may be more likely to develop particular kinds of cognitive styles; and so on. Nevertheless, the notion of cognitive style enables us to focus on the learner himself. In turn, this enables us to free ourselves from the idea that learning proceeds according to fixed principles that depend upon relatively invariant properties of the task and upon uniform developmental progressions from one age to the next.

I have tried to make the following points:

1. There are significant relationships between cognitive style and early learning. Although most research has been conducted with older subjects, especially college students, we can certainly suppose that similar considerations apply to children. Factors of interference-proneness, conceptual as opposed to perceptual approaches to problems, active search in contrast to passive reception of information, field-independence, and so on surely can be regarded as entering at early ages into learning. Special measures, suitable for the age-group in question, may have to be developed. Research has, as yet, barely scratched the surface in this area.

2. Conditions under which learning takes place have a two-fold significance. On the one hand, they influence the development of cognitive structure itself, for example, by promoting memorization versus discovery strategies. On the other hand, children differ in already-developed cognitive structure, which determines whether performance will be more

or less effective. For example, simple, highly differentiated, stepwise, concrete tasks favor persons who use perceptual, memorizing, concrete approaches; contrasting kinds of tasks favor conceptual, hypothesis-forming and -testing, discovery strategies.

3. Other characteristics, including attitude, set, motive, and reward, influence the quantity and quality of learning. In general, such factors add up to the principle of relevance, which states, in effect, that people do best in tasks with special meaning or importance for them.

4. There is only a general relation between age and performance and between ability and performance. These relationships appear as averages, when children are tested just as we find them, ignoring individual differences and special training.

5. Training and motivation can markedly influence the rate of learning and the kind of effects produced by learning. That is, we can act upon the establishment of cognitive structure, and thus influence the learning process. A point of great interest concerns instruction about strategy itself, as opposed to teaching methods oriented towards special kinds of tasks. By this I mean that we can teach children how to recognize strategy and how to adapt strategy appropriately to requirements of the task. In short, over and beyond the acquisition of specific skills and the establishment of cognitive styles there are processes of problem-formulation and of decision about how to proceed. I believe these aspects of learning deserve intensive study.

6. All of these considerations have important implications for later learning. The teaching process faces a dilema between inducing effective performance in the immediate situation and preparing the child for future situations. Relations between cognitive structure and early learning have a great deal to do with later learning.

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SOME OBSERVATIONAL TECHNIQUES FOR APPRAISING DEVELOPMENT

(Drawn principally from the New York City Project)

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It will be wise for me--and perhaps helpful to you--if I state at the outset some of the personal opinions and prejudices that color my thinking, hence my remarks, about techniques for assessment of human development. The position from which I view intellect (intelligence), for example, can be described concisely in five parts. I believe:

1. That intellect is *developed* rather than inherited;
2. That it grows out of a small collection of *biological reflexes* which are pretty standard equipment among human infants everywhere;
3. That it grows as a consequence of *interaction* between the individual's developing intellect and his environment;
4. In a process composed simultaneously of *assimilation* of the environment by the intellect and accommodation of the intellect to the environment;
5. *If* the steps in the assimilation and accommodation processes are very small and somehow related to what is already in the intellect.

This definition of intelligence is drawn largely from hypotheses advanced by Jean Piaget of Switzerland and modified or extended by J. McVicker Hunt and Jerome Bruner and others in this country--though none of these distinguished people should be "blamed" for the deductions which are mine.

Reduced to the simple language that I use with myself when I think, what this definition means is that: *For the practical purposes of helping children* to learn, I regard intelligence as a learned skill rather than as an inherited characteristic. Whether this turns out to be 100% true when all the evidence is in does not concern me, for even if it is only 60% true it is an extremely useful working hypothesis from which to start any inquiry into intellectual development. It is my platform; from here I can operate. (And I suspect that it is going to turn out to be at least 90% true anyway.) So the first personal opinion I want you to know about as you listen to me is that I think intelligence is learned rather than inherited.

My second prejudice--the one that probably is indirectly the reason for my being here--has to do with the methods we use for appraisal of human development. I am referred to in the trade as a "measurement man"; I have worked for fifteen years in Educational Testing Service; the best known tools of my craft are the punched card and the standard deviation. Yet the single major gospel of my mission among educators is that to know people well enough to teach them we need to OBSERVE them as well as measure them. It seems to me that educational and psychological measurement have contributed importantly to our slowly growing science of pedagogy--and they are likely to continue to do so--but it also seems to me that in the burgeoning of measurement we educators have allowed our skills in observation to atrophy, our concern for total understanding of the individual to languish. The depth of our insight lessens, I believe, when we fall into the practice of only measuring people and not really LOOKING at them.

And this suggests the third personal opinion that shapes my point of view. Our present techniques in psychological and educational measurement fall far short of complete usefulness in assessing the affective or emotional context within which intellectual activity goes on. Only a few human beings have developed a capacity for thinking and acting--part of the time--in a wholly logical or intellectual context. The rest of us spend our lives acting and thinking in an emotional context--spurred to action by emotional motivation, satisfied by emotional rewards, kidding ourselves now and then by rationalizing our conduct in intellectual terms, but seldom pulling ourselves out of the emotional soup in which we swim. And to the extent that our "measurement" of the intellectual characteristics of any human being neglects to take into account the soup of emotion in which that human being is immersed--to that extent the measurement is incomplete, unrealistic, and perhaps biased.

Putting all three biases together, we have the platform from which I view my topic: *Intelligence is a learned skill which needs to be observed in action as well as "measured" because it operates in a context of emotion that tests usually don't include*.

Enough of preliminaries. You all are as familiar as I am with young people whose intellectual skill--demonstrated in their accomplishments--is far greater than their test scores would lead anyone to suspect. You are also familiar with youngsters who seem to do a better job on tests than on anything else. What I am here to talk about is how educators can fill in around test scores with observational information--to obtain a more complete and accurate picture of each student's characteristics as a learner.

My text and most of my illustrations are drawn from two major projects, one in New York City and the other in California. Each of these projects has an interesting background--which is also a part of my narrative.

In the winter of 1963-64, the administration of the New York City school system sent a team of executives to visit my organization (Educational Testing Service) and discuss a problem that appeared to grow more pressing day by day. Most concisely, the problem was this: The techniques being used by New York

City to test children--hence, to group and organize them for instruction--were quite obviously inappropriate for large numbers of children entering the schools. Since New York City had for years operated one of the most sophisticated testing programs in the country--possibly one of the best programs--this was a serious situation not only for New York but for everybody interested in appraisal of human development.

As is often the case, a non-educator helped to locate the center of the problem. In this case, it was the writer, Hillel Black, author of They Shall Not Pass* who not only pointed out the problem but brought the newspapers and critics of the schools out in full cry. Black devoted a whole chapter to the classic example of one little girl--Maria--who illustrated the problem with tragic clarity. Maria was a small Puerto Rican immigrant whose performance on group tests of intelligence and reading readiness in the primary grades yielded low IQ's and "readiness" scores so she was put into "slow learner" classes--and kept there in spite of her teacher's efforts to explain to the school authorities that the child was quite bright in her own Spanish-speaking environment but was not yet very capable of handling problems posed in English. Her tragedy lay in being cast with dull children instead of being helped with English. The tests were not appropriate for the Puerto Rican child--did not "fit" her--because they presented her with problems in what was, to her, a foreign language.

To get the feel of how this might be if you and I were in a comparable position, let's try some analogies. Suppose we went someplace to apply for a job and the man said, "Take this test so I can see how bright you are and what you are qualified to do." And he handed us a test that looked like this. (Slide No. 1) How many in this group feel confident of being able to answer three out of these five questions? They are easy for a Puerto Rican teen-ager with just a junior high school education!

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*Hillel Black, They Shall Not Pass. New York: Morrow, 1963, 342 pp.

Unfair, you say, because the questions obviously are in a foreign language? A poor example? Okay, try this one...in English. (Slide No. 2) After you have answered the one common-sense question, look at the information about the question at the bottom of the page. More than half of high school seniors taking the College Board's Scholastic Aptitude Test get this one right--I repeat: high school seniors.

Still unfair? You have more in the Brains Department than a test with content like this would let you show? It's in English, isn't it? And if bright high school seniors can do well with this kind of intellectual task, why should it be unfair for adults who have finished college? However, to show you that I'm not trying to discriminate against you--and to see if there isn't something that you can do well in a test--I'll give you one more chance to demonstrate how bright you are. (Slide No. 3) Since this one is based on a graph and requires almost no reading skill at all, I would expect you to answer four out of four correctly. Youngsters in the eleventh grade find this one quite easy--if they have completed the PSSC course in physics.

Have I made my point? Do you feel that one of these three tests has a sufficiently good "fit" for you to be able to demonstrate on it how capable you are mentally? This is how I hoped you would feel--for the three test pages you have just tried for fit are drawn from tests which are excellent instruments for other people; they don't happen to fit you because the language is not familiar to you and the problems are from an unfamiliar context. And yet, pencil and paper tests of all kinds are a far worse fit than this for nearly all young people in the group we call "disadvantaged."

Here, I am tempted to enter a strong plea. Please don't quote me as saying that tests are "no good." This is not what I have said or implied. What I have said is that even the best tests usually don't fit young people with cultural and educational handicaps--thus don't let them show their intellectual skills. One doesn't say that a Scottish tweed suit is "no good" simply because it is a size 44 and looks peculiar on a teen-age bantam-weight.

And I have said or implied that almost all tests are built for use with people who have average, middle-class, white, literate--backgrounds. Because this is true, young people who are above average in the cultural advantages their homes provide and who are well educated nearly always knock the tops out of tests built for the mythical "average" youngster; in fact, a special series of tests--the College Boards--have been built just to provide tests that are difficult enough for these favored kids. At the other end of the line, young people who have less than average in cultural resources and less than the average amount of schooling nearly always fall out the bottom of tests built for the average group. And this fact brings us face-to-face with one of the little-known truths of our time.

The "culture-free" and "culture-fair" tests of human ability that we hear about from time to time don't work very well, either. Work has not yet been completed on these kinds of instruments, but their trials so far have been disappointing; it appears that the whole circumstance of sitting down to take a test in a controlled situation is so utterly unfamiliar to culturally handicapped children that it makes no difference that the questions are about children like themselves rather than middle-class children. (Perhaps the recent work of Dr. Martin Deutsch has provided some new leads in this area.)

Back to the New York City problem. If the best tests were inappropriate for use with large numbers of children entering the city's schools--and they obviously were inappropriate for many children--what were the schools to do?

Clues to one kind of answer lay all around--in the work of modern researchers, in the comments of teachers, even in the chapters of the writer who had triggered the chain-reaction of criticism, Hillel Black. These clues all pointed toward the teacher. Could teachers somehow observe a child with sufficient validity to provide useful estimates of his intellectual development? Dr. Deutsch was already at work on an extensive research project in which a few teachers were being trained as specialists in "intervention" for the sake of the culturally-different children; but could all primary teachers in a massive school system be taught enough of the rudiments of "child-watching" to permit them to estimate intellectual development realistically? It was thought to be worth a try.

One small item of history might be interesting here. Precisely at the time when it was decided to press ahead experimentally with a program of in-service teacher training, the Board of Education in New York City outlawed the IQ! No more tests yielding IQ scores were to be used; IQ scores were to be expunged from the records of students. "If the IQ is all that bad," the Board said, in effect, "let's get rid of it now." Which was a sudden way of making "honest girls" of all of us by burning the bridges behind us. And it made quite a stir in the newspapers.

The content for a system of child-watching in which teachers could be trained was developed from two sources simultaneously: from the research of Piaget (to provide a unifying theory of development) and from the experience of primary teachers themselves.

From Piaget was borrowed the hypothesis that intellect develops sequentially through stages that have pronounced characteristics in behavior which can be observed. Piaget's "stages" are fairly gross in the number of years each covers (ages 2-6, for example for some of them) and they overlap and stretch and telescope, but they are nevertheless useful in digging a toe-hold for useful observation of children. Let me give you a couple of examples.

According to Piaget's observations, a child is passing one of the important milestones in his growth toward logical thought when, at least some of the time, he applies the principle of conservation of quantity. (Dr. Vinacke mentioned this in the morning session.) It goes like this: (Slide No. 6) Show the child two identical jars filled with water, A and A-prime. Talk about their equality; pour the water from one into the other to demonstrate their equality in volume. Then pour the water from Bottle A into Bottle B, which will hold exactly the same volume of water but has a different shape. Do the pouring while the child watches or have him do it. Now ask him which of the two bottles (B or A-prime) holds the more. If he has reached this particular milestone in his intellectual growth, the child will either say that both bottles hold the same amount--or express his contempt for such an obviously stupid question. If he has not reached this point in development, he is likely to say that Bottle B holds more because it is "fatter" or that Bottle A-prime holds more because it is taller.

Another of Piaget's "milestones" in development of the intellect is reached when the child is able--at least some of the time--to put himself in another person's place and see things from another point of view. (Slide No. 8) Here we have two children, on opposite sides of an easel, drawing the same object. Child A sees that object with the tallest stick on the left. Child B sees it with the tallest stick on the right. Until Child A has reached this particular milestone in her development, she literally cannot draw "how the sticks will look to Child B"--not even if she is allowed to walk around to the other side of the easel for a peek. Until she reaches this milestone, she can draw only what she perceives and cannot represent to herself the probable perception of somebody else.

These have been but two of the many "symptoms" of intellectual development observed by Piaget among children in the age range of four to eight years. His research was combed for others, to the end that a list of behavioral symptoms of intellectual development might be compiled. This became known by the project staff as the "Piaget List."

At the same time as the study of Piaget's research (winter and spring of 1964), teams of interviewers went to visit the teachers of kindergarten and the primary grades in New York City. Without mentioning Piaget or any theoretical framework for the inquiry, teachers (mostly in small groups around coffee and cigarettes) were asked simply: "What symptoms of intellectual development have you seen in individual children?" Once they recovered from the shock of the question--who ever heard of an "expert" asking a teacher's opinion about anything?--they literally poured out anecdotes about and illustrations of child behavior which they interpreted as positive evidence of growing intellectual skill. One anecdote will illustrate.

"Charlie," said one teacher, "earned a Binet IQ of less than 70 and fell out the bottom of the reading readiness tests.... BUT... I know for a fact that once a week Charlie gathers up the family wash, catches the right cross-town bus (in New York!) to reach the cheapest laundromat, uses all the proper coins and pushes all the proper buttons to buy detergent and wash and dry the clothes, and returns home by bus in the rush hour...and don't anybody try to tell me that Charlie is stupid!"

The collection of these anecdotes from several hundreds of New York City teachers became the "Teachers' List." It contained "symptoms" of intellect as revealed in the behavior of youngsters in music, in art, on the playground, in group activities, in isolated endeavor--as well as in the more academic activities of "school." The list contained several hundred separate items. And one of the exciting things about it was that when it was finally compared with the Piaget List, the Teacher List could be fitted into the Piaget List almost without an exception! This fact needs emphasis: The behavioral symptoms of intellectual development, as seen by New York City Teachers in children from deprived cultures, fit rather neatly into the hypothetical categories of a Swiss researcher who has been looking at Swiss and French children of the middle class! In other words, the Teachers' List could be defined as "Piaget expressed in the language of Harlem and Brooklyn Heights."

Such a discovery could lead only to one conclusion: The teachers do see important symptoms of intellect in young children. And this conclusion led to the next step in the project. If at least some of the teachers are already seeing some of the critical signs of intellectual development in some children, perhaps a program of systematic instruction would help most of the teachers to see some of the symptoms in most of the children.

Using the Teachers' List almost entirely (and still keeping Piaget and his technical nomenclature out of sight) a preliminary guide for teachers was prepared and assigned for experimental use by primary grade teachers in one school in each of the city's twenty-five districts. A couple of pages might illustrate what that guide was like. (Slide No. 4) Read the paragraphs in the middle of the page and the behavioral "symptoms" that follow. (Pause) Teachers in some neighborhoods were quick to point out that immigrant families from Puerto Rico were likely to have different perceptions of some of these family terms--that many Puerto Rican children will have several "uncles" around the home but no "father," and so on.

(Slide No. 5) Here is a set of behavioral symptoms in another category--that of listening comprehension. (Pause)

If you were to see more than just two pages of this guide, you would be struck by the fact that all of the behavioral symptoms listed are positive evidence of intellectual development. There are NO negative symptoms anywhere in the guide. The teachers whose contributions made the guide possible stressed this point. "We are sometimes able to see evidence that a child has reached a certain milestone in his development, but we never can be certain that he has not reached that milestone." Hence the process of observation being developed in New York City concentrates on positive evidence. The teacher who uses it well can say either of two things about a child:

1) "I know that Fred has reached this point in development because I have seen him do this and this and this...." OR
2) "I don't know what level of development Fred might have reached because I have not seen him exhibit any really symptomatic behavior."

And, of course, this point of view represents a major change in habit among educators. Imagine--a teacher not making a negative judgement about the intellectual development of a slow-learning child!

The teachers' guide was used last year by about 100 teachers in 25 schools in New York City--and was revised by them in the light of their experience with it. This year it is being used by four times as many teachers and schools, and will be revised again. Next year it will be used (I think) in all kindergarten and first grade classes in the city. It's name is Let's Look at First Graders: A Guide to Understanding and Fostering Intellectual Development in Young Children. (Hold up copy) (I'll tell you later how you can buy a copy if you can't live without it.)

To answer here a question that may have begun to bubble to the surface of your mind--What kind of a score does the teacher-observation yield?--it doesn't yield any score at all. The system takes cognizance of the fact that even at age six human beings are terribly complex creatures who simply cannot be summarized into a set of digits. The system is satisfied, therefore, if the teacher is able to describe some of the learning characteristics of each child in a way that will help her to understand him better and teach him better. What does anyone really need a "score" for, anyway?

The project has second and third facets. As nearly everyone anticipated, the teacher's guide didn't work with some children--notably with those kids who do their best to remain "invisible" in the strange environment of the classroom--the shy children, the withdrawn ones, the potentially disturbed ones. These are the children who are not "seen" by the teacher because they don't do anything; they reveal no behavioral symptoms of anything. How should the teacher get at them?

A second set of materials (which still don't have a name that will stick) was developed for use with such children. In essence, these materials describe activities which can be used to draw out the withdrawn kids, to lure them into activities in which they will exhibit symptomatic behavior. The problem of the bottles from Piaget is one of them--it has many variants as a game. (Slide No. 12). Another is an activity involving arrangement of simple pictures according to a logical time sequence. Signal Slide change (Slide No. 13). Here is a reversible sequence idea that can be demonstrated non-verbally. There are activities and materials easily "come by" in every school--balance beams and sorting games and water sports with mason jars--described so that the teacher can use them to lure the less visible children into involvement that will let them reveal their intellectual development. All these ideas are bound up in a little experimental manual for teachers entitled: "Instructional and Assessment Materials for First Graders." (Hold up copy) This manual is one year behind the teacher's guide in the experimental process, so it is comparatively rough--a first draft to be revised at the end of this school year.

The third (and final) set of materials being developed in the New York City project is also in its initial year of try-out. It resembles a "test" more than either of the other two sets of material. What it *really* is--is *a combination first grade curriculum and intelligence test and achievement test three months in length*. In part, it works like this:

(Slide No. 17) Here is a little printed folder of exercises in number function. In the illustration, the child is asked to mark the picture having MORE apples, FEWER peanuts, MORE turtles, MORE money--and the other pages in the folder continue the same exercise. Different booklets repeat the same kinds of exercise in perception of MORE and FEWER each day on Monday through Thursday. Following the exercise each day there are activities suggested for re-inforcement. When the exercise is given in its fifth version (on Friday) it is treated as a *test* and the child's success with the task is noted. Here is another: (Slide No. 18) This is the booklet for the third day in the sequence on logical reasoning. The directions read: "In the first game, the owner of a pet store wants to put the fishes of different colors into separate tanks. The small color circles on the top of the tanks tell him the color of the fish which *belongs* in each tank. There is a light circle, a dark circle and a black circle. You can see that the dark fish and the black fish are where they belong, but there is one *empty* tank. Can you find the fish that belongs in the empty tank? That's right. The light colored fish has a big X on it because it belongs in the tank with a light circle above it. Now, let's try the next game together..."

In this series of experimental materials there are sets of five exercise booklets and suggestions for daily follow-up instruction in each of six different learning areas:

1) Shapes and forms
2) Spatial relations
3) Time concepts
4) Understanding mathematics
5) Communication skills
6) Logical reasoning

All of these are managed and applied through use of a "Manual of Directions for Written Exercises for First Graders." And if you ask me whether I think this is testing or teaching, I'll answer "Both!" and challenge you to tell me why the two things should have to be kept separate.

In summary of the New York City project to date: You have had a glimpse of three different but related techniques being tried out in the hope of being able to teach first grade teachers to see the intellectual characteristics of their pupils by means of systematic observation. If educators can break some of the habits they have built in forty years of "measurement"--habits of dependence on such notions as inherited intelligence, the stable IQ, the reliability of test scores, and all the rest--perhaps this or a similar technique for observation will help teachers toward a deeper insight into individual learner's problems. That, quite simply, is the goal of it all.

New York City quite wisely printed extra copies of all the experimental materials on this second go-'round--and asked ETS to distribute them to interested educators at the cost of printing. Write to Dr. S. Donald Melville at Educational Testing Service, Princeton, N. J., 08540, for a price list and ordering information.

The New York City project has been my major focus here, but I need to mention the Process for In-School Screening of Children With Emotional Handicaps as a second major technique for assessing the characteristics of human development by observation.

In the introduction of this paper (my third personal opinion) I said that for most of us all intellectual activity is carried on in an emotional context. If this is true, then the emotional context in which the individual does his school learning must be terribly important--so important as to control whether that individual learns in school or not. Researchers in this field reach various conclusions, but taken as a whole the available evidence indicates that ten to twenty-five percent of children in school are seriously handicapped in school learning by shortcomings in emotional adjustment.

It follows (if one accepts these initial ideas) that the teacher who has some "feel" for the emotional environment a child perceives the classroom to be--will have a better chance to "reach and teach" that child. Further, if a child is seriously disturbed, the earlier he can be identified and brought to professional help the greater is the chance that he can be brought back to mental health.

Now available as experimental tools for use in bona fide research programs is the series of instruments in the "Screening Process" I mentioned. Developed by Bower and Lambert on combined grants from the U. S. Office of Education and the California State Department of Education, here is a series of techniques for estimating the degree of alienation of a child by observation. The technique combines the observation of the child by his teacher with observation of the child by his peers and observation of the child by himself. This is done ingenuously and quite simply in a process that teachers can learn to handle well in a short time.

No child gets a "tag" hung on him in the Bower-Lambert process. (I've always resented my own classification as an introvert when at heart I am a fearsome swachbuckler.) Rather, if a child in this process is perceived as alienated--"different"--by two out of the three sources of perception (self, peers, teacher) he is simply identified as one who should be looked at more closely by a trained observer like a psychologist.

There are materials in the California set appropriate for "screening" work by classroom teachers at three levels: primary grades, junior high school, senior high school. I mentioned them even thus briefly because, like the New York City techniques, they depend upon the trained observation of pupils by classroom teachers.

What does all of this add up to? I think it adds up to this: We in education have reached a point of diminishing returns in formal "measurement" of the young people whom we teach. Much of the measurement we use is good--but we need to add to it a great measure of just looking at our students as learners. The New York City project and the California screening process are only first and faltering steps in this direction.

Slides projected by Mr. Aldredge

APPENDIX

(Slides as referred to in lecture)

No tenía suficiente dinero para salir de apuros; sólo contaba con lo que producían los campos. Y completamente solo, ocultando a la familia su situación, siempre teniendo que sonreír cuando estaba con su mujer y sus hijas las cuales le recomendaban que no se esforzase tanto, el pobre Sánchez se entregó a la más frenética locura del trabajo. Se olvidó del sueño. Quiso cultivar todas las tierras y hasta trabajaba de noche. Si su familia estaba ciega, en las cabañas vecinas bien adivinaban la situación.

Lo peor era que a pesar de sus esfuerzos sólo podía pagar una pequeña parte de su deuda. Los resultados de este exceso de trabajo no se demoraron mucho. El rocín, cansado de trabajar de día y de noche, expiró sin permitirse el menor intento de rebelión contra su pobre amo.

29 ¿A qué se dedicaba Sánchez?
A A la antropología
B A la alfarería
C A la labranza
D A la arboricultura **29**.......

30 ¿Cómo actuaba Sánchez delante de su familia?
A Fingía estar dichoso.
B Se quejaba sin cesar.
C Se entristecía mucho.
D Se desmayaba de cansancio. **30**.......

31 ¿Qué actitud tenía la familia de Sánchez?
A Estaba enterada de la situación.
B Ignoraba la gravedad de la situación.
C Le recomendaba que trabajara más horas.
D Le sugería que vendiera los campos. **31**.......

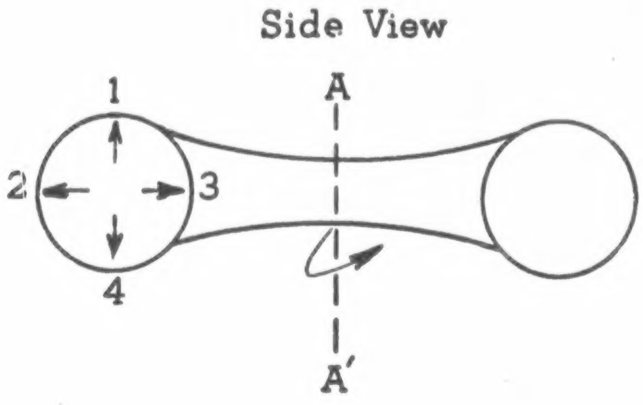
32 ¿Qué ocurría en casa de los vecinos de Sánchez?
A Ignoraban la verdad.
B Ofrecían prestarle dinero.
C Le maldecían y le maltrataban.
D Se daban cuenta de sus apuros. **32**.......

33 ¿Con qué culminó la situación del pobre Sánchez?
A Con la ida de su criado
B Con la muerte de su caballo
C Con la amortización de sus deudas
D Con que la familia se enteró de lo que pasaba **33**.......

2

Question 17

One method of obtaining "artificial gravity" in a space station is to have the station rotating about axis AA′ as it revolves around Earth.



The inhabitants of the space station would call which direction "down"?

(A) Direction 1
(B) Direction 2
(C) Direction 3
(D) Direction 4
(E) Any one of the four, depending on speed of rotation

Statistical Analysis

	Students Classified by Total Test Score				
RESPONSES	LOWEST FIFTH	NEXT LOWEST FIFTH	MIDDLE FIFTH	NEXT HIGHEST FIFTH	HIGHEST FIFTH
Omit	3		1		
A		1		1	
*B	12	17	19	29	28
C	8	4	6	1	
D	7	9	6	3	6
E	4	3	2		
Total	34	34	34	34	34

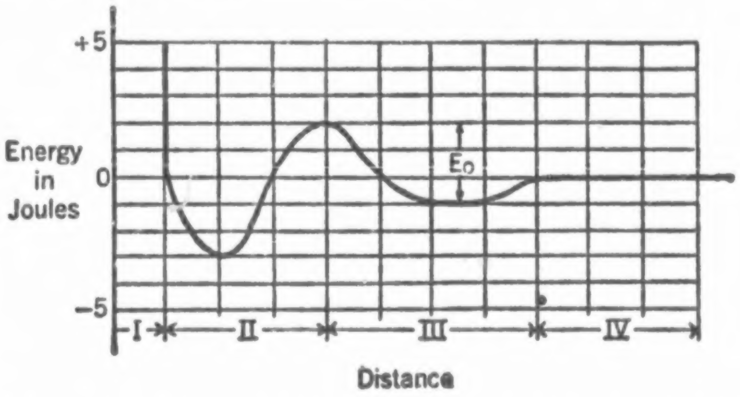
Per cent of total group of 170 students answering correctly 62%
Correlation between success on this question and total score on test .44

---

*Correct answer

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one which is best in each case and blacken the corresponding space on the answer sheet.

Questions **17-20** relate to the following graph and information:



The graph shows the potential energy of a particle as a function of the horizontal component of its distance from some point *0*. The horizontal line continues indefinitely to the right. Use Newtonian mechanics throughout.

17 A particle having a total energy of −2 joules may possibly be found in Region

- **A** III only.
- **B** II only.
- **C** II or III.
- **D** I or III.
- **E** IV only.

18 A particle free to move in Region II has been at rest there for some time. The energy that must be given to it if it is to go from Region II to Region III is

- **A** equal to E_o because of the conservation of energy.
- **B** equal to E_o because the particle is at rest in either region and therefore has zero kinetic energy in each region.
- **C** less than E_o because the particle at rest in Region II has less energy than when at rest in Region III.
- **D** more than E_o because the particle at rest in Region II has less energy than when at rest in Region III.
- **E** less than E_o because momentum must be conserved.

19 A particle free to move in Region II has been at rest there for some time. Which of the following is the minimum energy that must be given to the particle to get it into Region IV? (Hint: the particle will not be at rest in Region IV.)

- **A** 2 joules
- **B** 3 joules
- **C** 4 joules
- **D** 5 joules
- **E** 6 joules

20 A particle having zero total energy when it is in Region II

- **A** also has zero potential energy.
- **B** has a maximum kinetic energy of +2 joules.
- **C** has a maximum kinetic energy of −2 joules.
- **D** has a maximum kinetic energy of +3 joules.
- **E** has a maximum kinetic energy of −3 joules.

GO ON TO THE NEXT PAGE

Draw or build different-sized houses or garages and match them to different-sized people or cars. 2F04

Match things which differ along *separate* dimensions—the lightest shade of paint for the shortest child, for instance. 2F05

DEVELOPMENTAL TASK

The simple matrix of two dimensions. The child can construct a simple matrix differing along two dimensions. 2F51

Mutual or complementary relationships are much more difficult for the child to grasp because they often do not involve any tangible comparison. The young child may know perfectly well that John is *his* brother, but has great difficulty in understanding that *he* is John's brother.

While genuine understanding of mutual and complementary relationships is usually not attained until middle childhood, the following are signs that the child is developing such an understanding.

In answer to *direct questions* or in *spontaneous behavior*, the child shows that he:

Understands he is a brother or sister to his own siblings. — Positive Reciprocity! 2G01

Includes or counts himself in the total pool of brothers and sisters in the family. 2G02

Realizes that there must be at least two people involved and shows some understanding of their relationship when he uses such terms as "brother of," "friend of," or "enemy of." 2G03

Can correctly identify his own right and left. 2G04

Can correctly identify the right and left of someone opposite him. 2G05

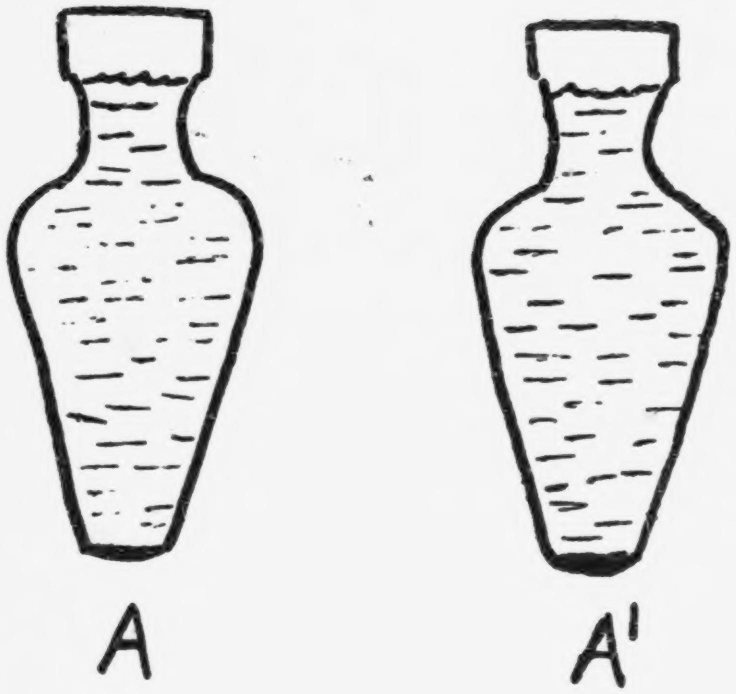
LISTENING COMPREHENSION

Until a few years ago, listening was an act we took almost as second nature. Now, however, we know that listening is actually one of the most complex of human acts, involving many learned skills. While our understanding of these component skills is still in the infant stage (over 90 percent of the listening research has been conducted since 1952), we do know that such factors as auditory discrimination and attention are vital to the over-all listening process. Most primary grade teachers, for instance, have long been aware of children who cannot discriminate well among the sounds of our language and who, therefore, cannot take full advantage of instruction in phonetic analysis.

Because listening is so crucial to learning, the teacher must be sensitive to the child's developing ability in this area. The following are examples of behavior that reflect *over-all ability to listen with comprehension.* (Indications of auditory discrimination and attention skills will be discussed on the following pages.)

The child demonstrates listening comprehension when he:

Follows complex verbal directions in English—the directions may be given either by the teacher or another child.	4C01
Follows complex verbal directions given in another language or dialect.	4C02
Is able to get the "gist" of directions by a combination of listening and imitating the behavior of other children.	4C03
Follows simple directions in craft activities.	4C04
Follows directions in songs or games.	4C05
Draws inferences about the meaning of words from their context or from the tone of voice and gestures of the speaker.	4C06
Retells a story, getting main ideas in the proper sequence.	4C07
Retells a story in proper sequence by drawing it in pictures or by acting it out in a play or with puppets.	4C08
Anticipates the ending of a story or what comes next.	4C09
Asks pertinent questions before the teacher gets to the end of what he is saying.	4C10
Laughs at the right time when a story is read.	4C11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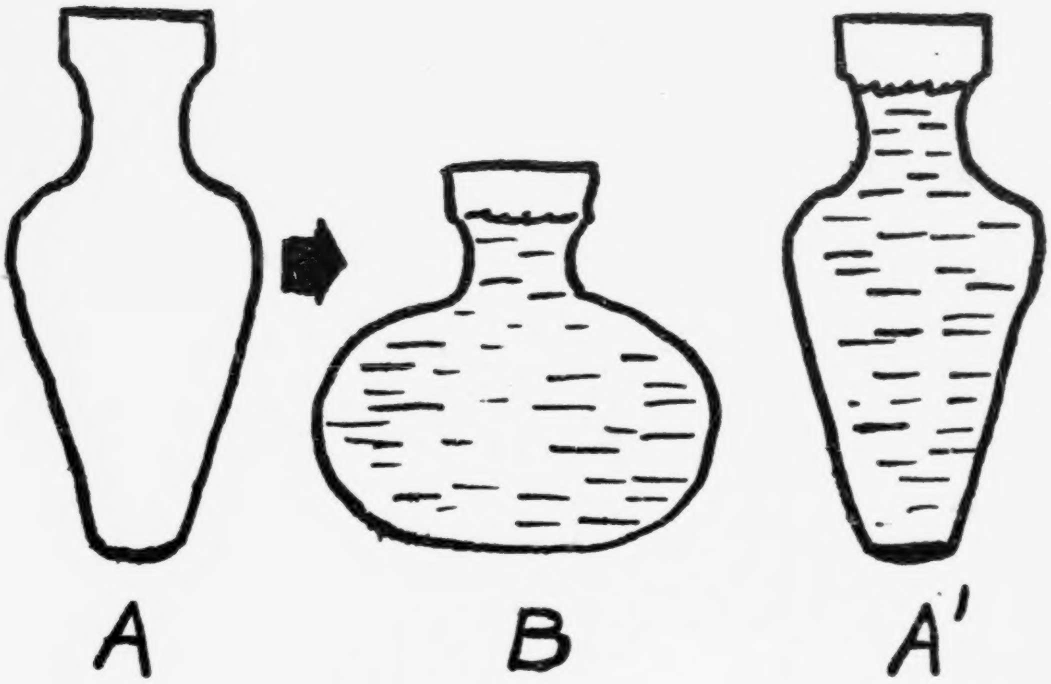
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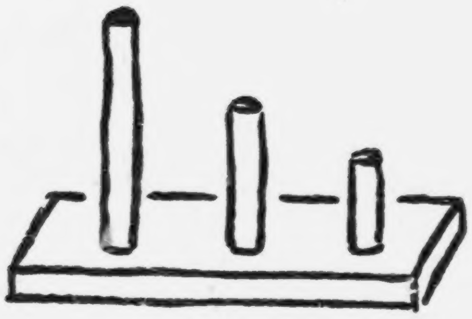

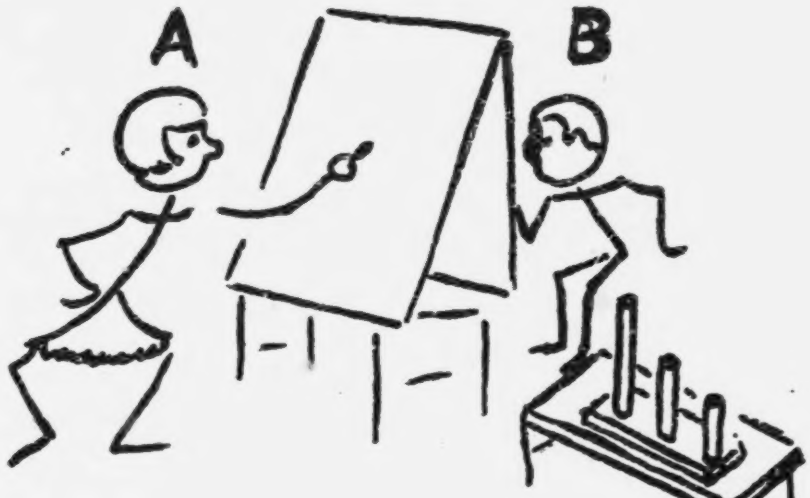

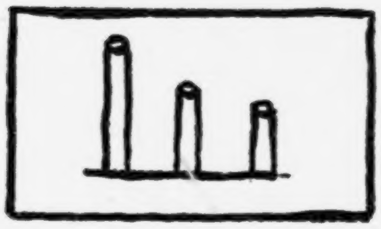

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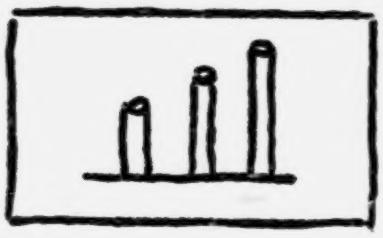

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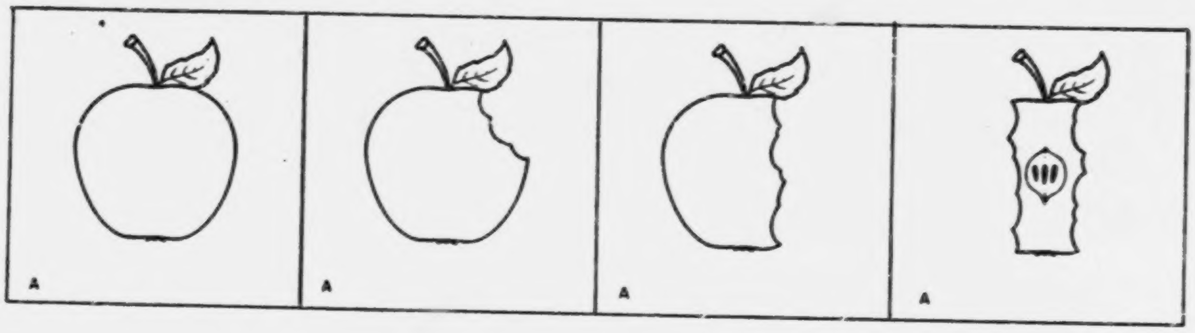
12

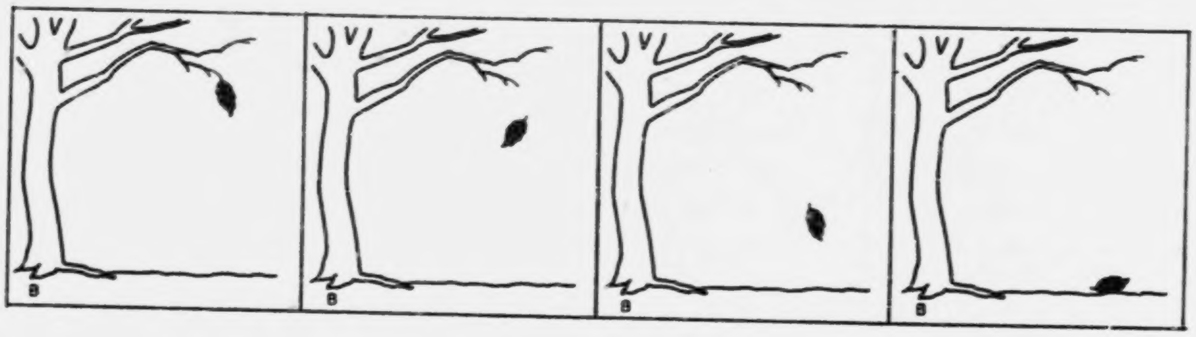
SEQUENCE CARDS

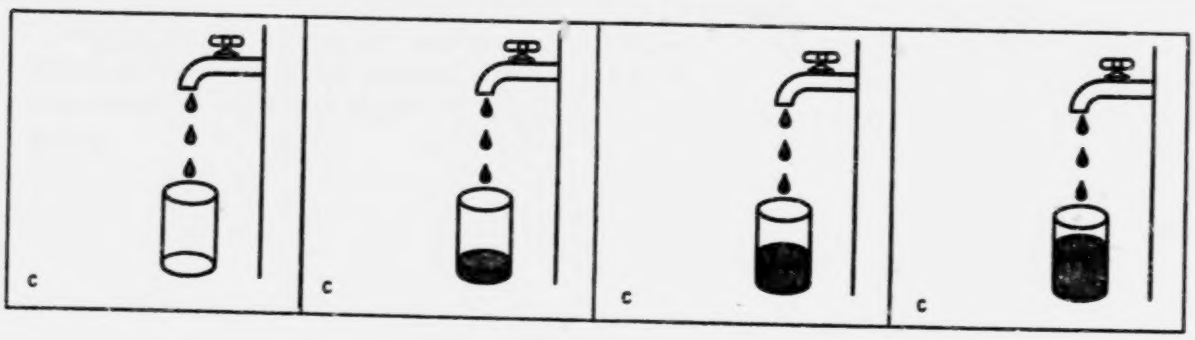
OBJECTIVES: to provide an activity which helps children to think logically about various sequences of events . . . to stimulate interest in observing what happens over a short or long period of time.

DESCRIPTION: There are ten sets of small cards for each student and a duplicate set of large cards for the teacher. Each set consists of four cards showing various kinds of sequences. The child's task is to put the cards in correct order to "tell a story." The ten sets of cards differ somewhat in nature, purpose, and difficulty level, as described below.

Short Term Sequence: Sets A, B and C help children observe detail and gain understanding of the logical, irreversible order of certain kinds of events.



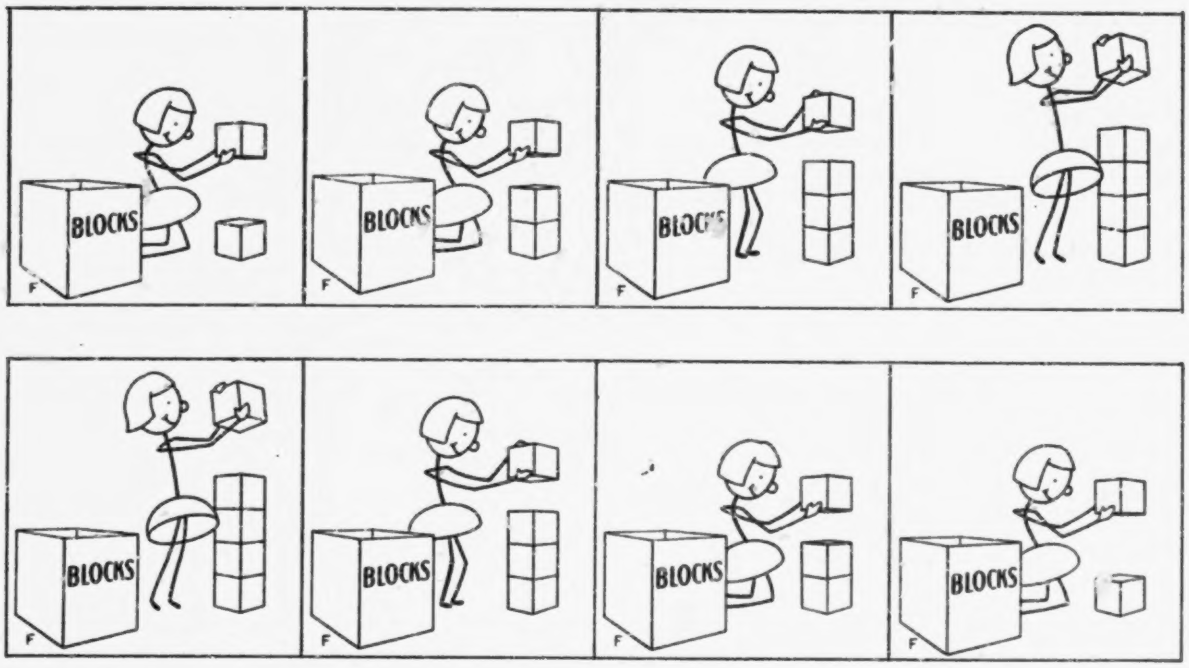




13

SEQUENCE CARDS (Continued)

Reversible Sequences: Set F helps children grasp the value of using verbal symbols to interpret an ambiguous event. The girl may be either building a tower of blocks *up* or taking them *down*. The child cannot logically determine *any* proper order without naming the kind of transformation that is taking place. Only by using words can he organize the pictures in a meaningful way.



Reversible Sequences: Set G, like the previous one, is deliberately ambiguous. The emphasis again is to get the child to label the action or change he thinks is taking place. In this set, the group of pigeons to the left of the trash basket may be interpreted as getting progressively *larger* or *smaller*.

At first, all the pigeons may be congregated to the left of the basket and then some of the pigeons go over to the right. Or, the reverse interpretation may be made: the pigeons start out in equal groups and move over to the left so that all the pigeons are on the left side.

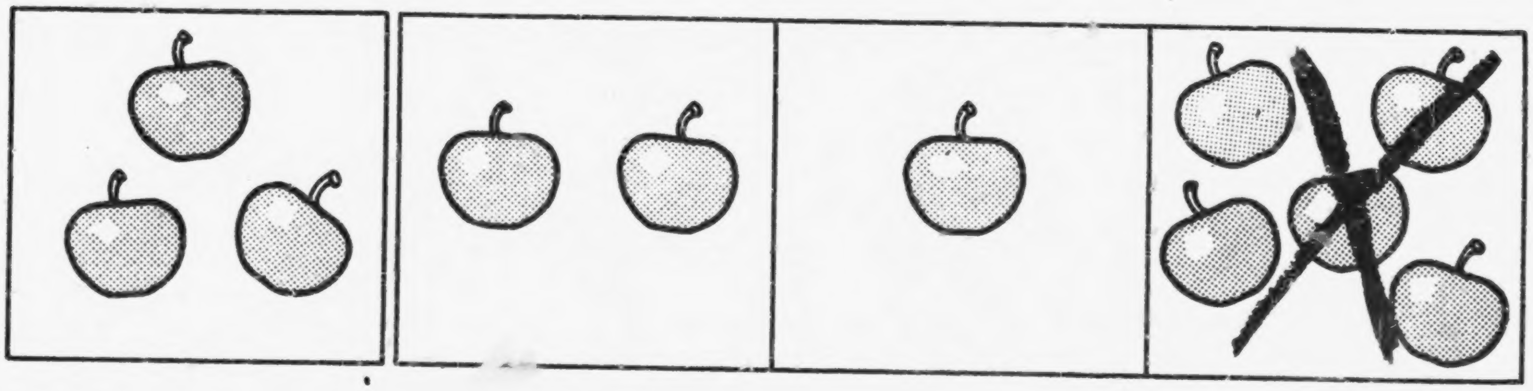
Presumably, these pictures could also be arranged randomly in some order other than those shown here. If the pigeons are not going progressively from left to right or right to left, however, the child should be asked to come up with some other explanation for their actions.

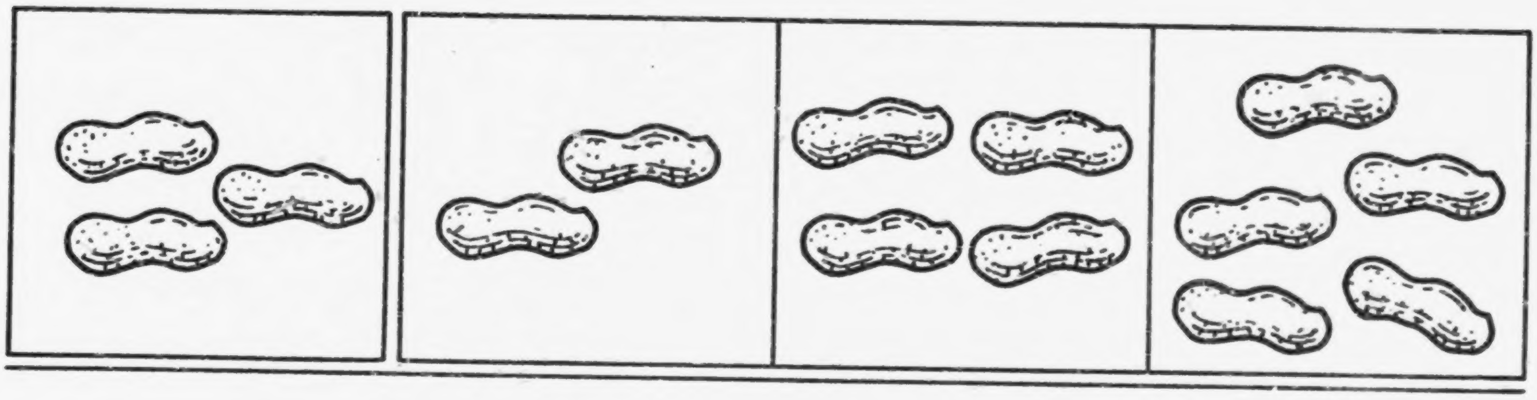
PRECEDING PAGE(S) MISSING

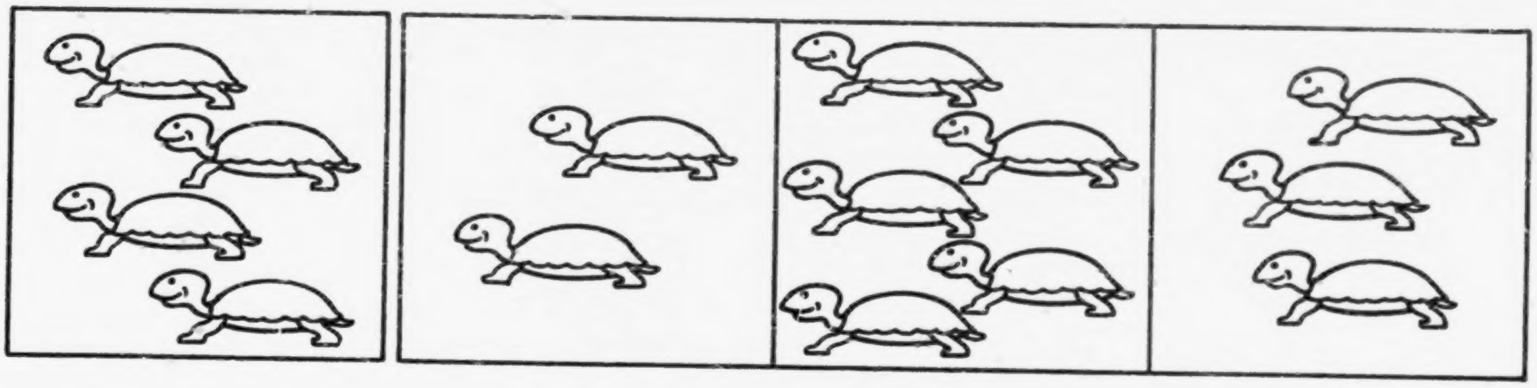
NAME_______________

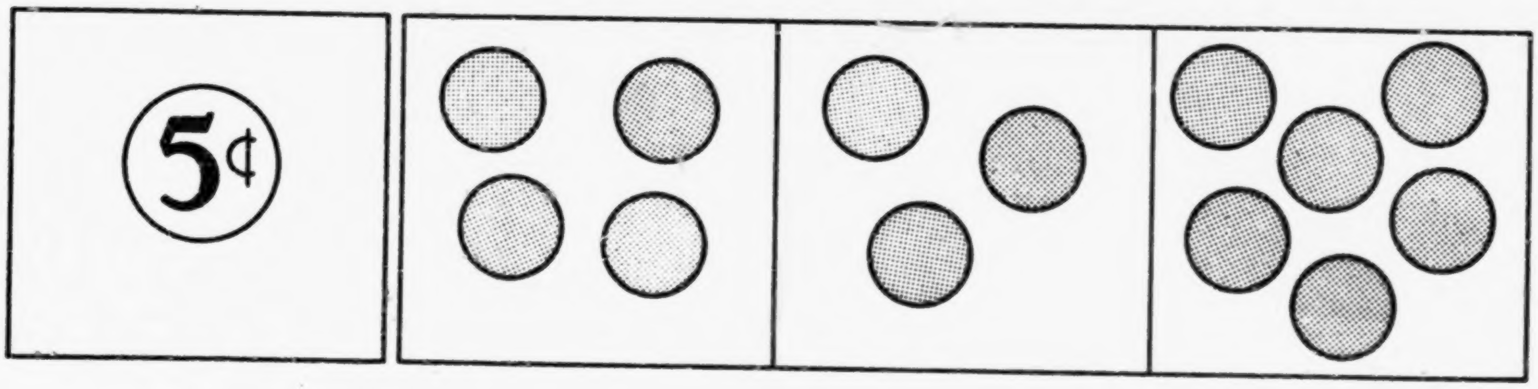
17

UNDERSTANDING MATHEMATICS









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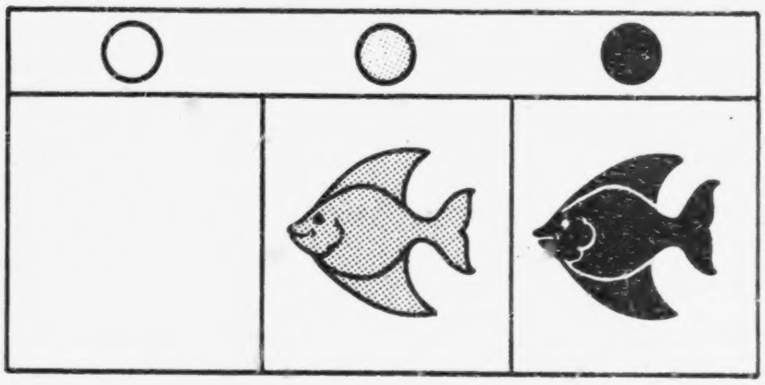
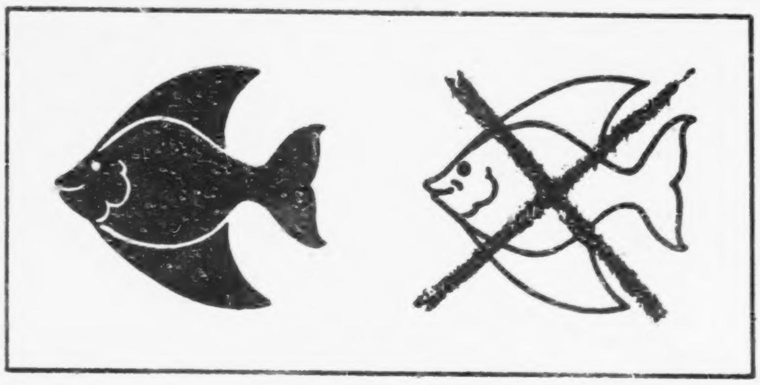
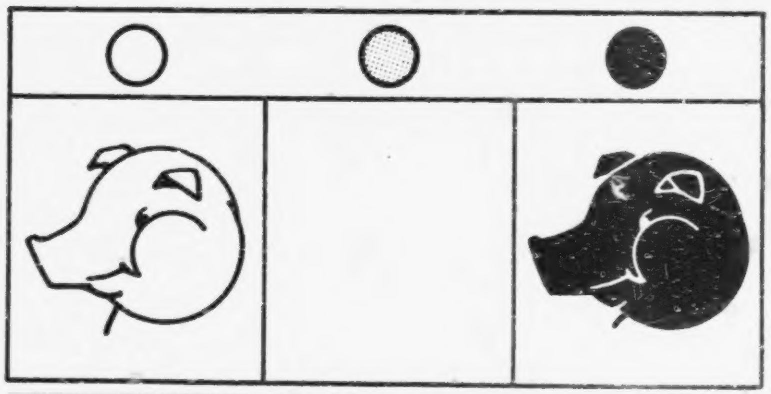
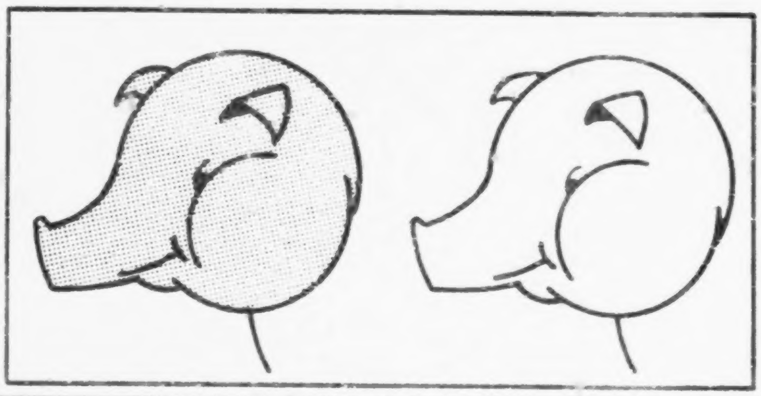
18

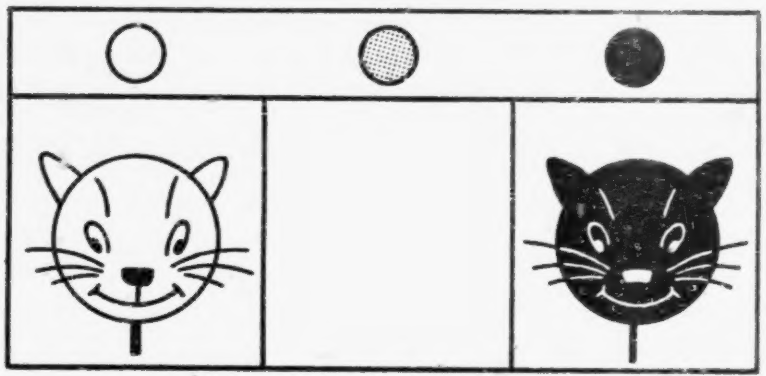
LOGICAL REASONING

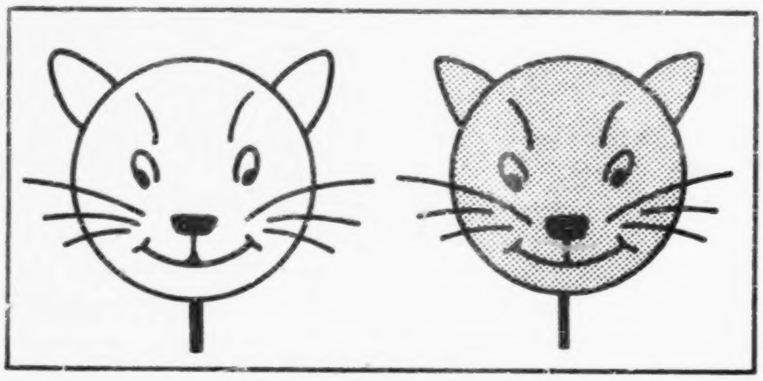


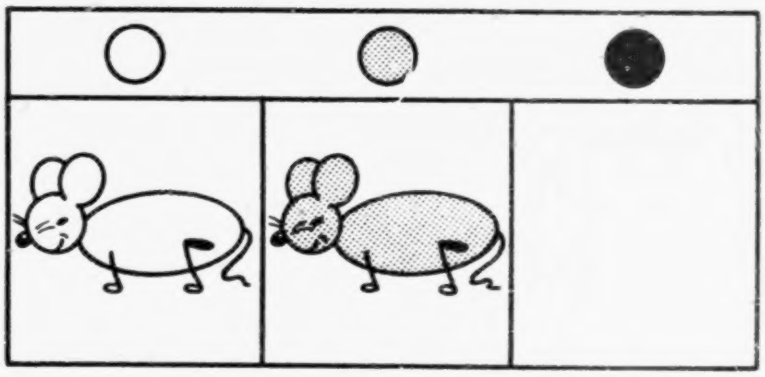


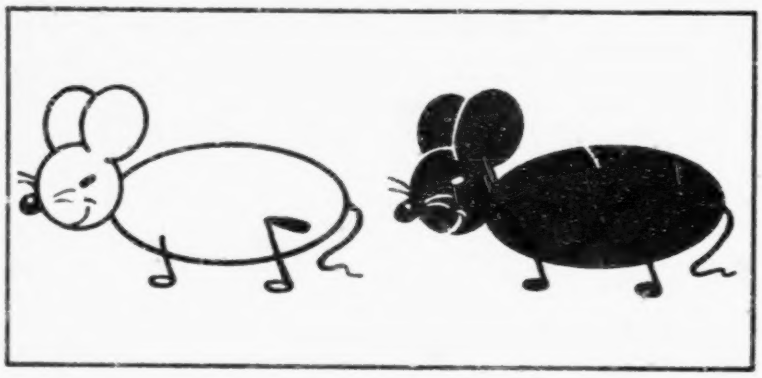












4

University of Georgia
Athens, Georgia
January 21, 1966

SCHOOLS FOR TOMORROW

George D. Stoddard
New York University

I

To glimpse the future in education we need to look to the past. In past ages, the art of teaching was at times highly regarded. Tribal customs called for teaching; mixed with fear and hope, teaching the young was a way of insuring survival. In civilized communities teaching became a necessary means of preserving laws, traditions, and dogmas. In a few cases, such as Egypt, Greece, Rome, and pre-Columbian America, it was a central feature of the social structure. Still, learning was reserved for the chosen few. Up to recent times, this remained true around the world. Only a generation ago illiteracy was rampant in India, China, and most of Africa. It was a common condition in Eastern Europe and South America.

It turns out that neither ignorance nor knowledge is bliss. We school people continually ask ourselves why it is, as we turn a whole society from ignorance to knowledge, and thereby increase the gross national product, we nevertheless have recourse to so much escapism and violence--to alcoholism, drug addiction, delinquency, crime, neuroses, psychoses and war. Where is the worm in the apple? If a further transmutation of knowledge into wisdom will put a stop to this, why is the process so slow and unpredictable? Have the schools as a whole, painfully moving away from a fragmented approach, overlooked some essential ingredient of the whole child and the whole man? Is the sense of wholeness itself divorced from the composite social structure?

Not all these questions are new; they go back to Confucius, to Homer and the classical philosophers. What is new is their economic and political setting. Americans have come into wealth on a scale hitherto unknown. We know the secret of this. It lies in two virtues and a unique heritage.

The virtues are a productivity based on technology and a social theory based on human rights and aspirations. Now, no man can safely be beaten, ignored, or oppressed. Our sense of the future does not condone the least touch of brutality, even though brutality is all about us.

The heritage, unequaled elsewhere on this planet, is a vast continent of a nation, rich and diversified in natural resources. The door that opens upon resources, leading to the highest cultural values, is education.

Thus on the economic side, apart from the ever-present threat of war, we should have no deep concern. If we keep advancing the educational, vocational and social expectations of every family there will be no "population explosion" in the United States. Moreover, this is a principle we can export to other nations: if you seek massively to raise the standard of living, a demand for birth control will follow.

A second exportable item is this: no matter what our troubles are, we prefer to trust them to an educated population. This is an article of faith. In the long run we hope better to understand the young so that their graduation into adulthood will diminish the zeal for an antisocial posture. As I see it, the schools of tommorrow, working not only through the curriculum but also through organizational changes, will gain a new power to affect the social order. To accomplish this, we must try innovations at all educational levels and test their validity. Above all, we need a unified program of heart and hand and mind, of thought into action, of action that is rewarding both to the person and to the social structure.

I should like now to mention a social phenomenon which, unlike economic productivity, is a permanent cause for concern. I refer to the steady push toward the city and its suburbs. This movement bears upon the future of education in the United States from kindergarten to college.

The chief characteristics of a city (that is to say, a metropolitan district) are to be found in the quick perception of its citizens, in a collective but rarely mentioned dependence on farms, factories, and public services, and in the urge to build, tear down, and build again. In these artificial surroundings people move about, close and hot like nuclei in search of lost electrons. Stability is achieved through a vast network of attraction and repulsion. As a result, city people do not rust out, they wear out.

A city, intellectually undernourished in spite of its ceaseless activity, challenges the schools, as it does all social and religious institutions, to give it light and meaning--from the outside as it were. The city, after all, is people. It needs a group of scholars and observers shomewhat detached from the give-and-take of its everyday life. History is written as much through cities as through states and empires. In fact, has there ever been a superior culture outside of cities? The poets who sing of the joys of rural life as a rule have moved away from it. Leaders in art and thought who live in villages and small towns transcend their enviroment without transforming it. There is, however, a notable exception to this generalization, namely, the small town that boasts a large college or university. This is the university city whose population really is the sum of its citizens and the student body. The city is challenged to develop and protect intellectual enterprises alien to its housekeeping chores.

But a city can be as rundown as any farm. Substantial segments of the pupulation may be denied access to its cultural and professional advantages. There lies the problem. Up to now most cities have been content to emphasize their conspicuous achievements, let us say in finance, elite housing, or a system of parks. Henceforth, first the sociologists and planners and then the citizens as a whole, will demand an over-all appraisal. The focus will be on the growth and happiness of persons. Inevitably--it is already starting--the schools will come up for examination.

Today I cannot go further along these lines. It is time to turn to a few topics that, for the school, foretell the shape of things to come.

II

A commitment of the teacher to "society itself," as against "subject matter alone" seems axiomatic, but we should be careful. No commitment is ever made to subject matter alone. Let us not, for all that, downgrade subject matter. The subject matter of Socrates, Copernicus, Galileo, Milton, Luther, Newton, Darwin, and Einstein set fire to the whole fabric of society and authority.

In the United States organized education is primarily a responsibility of the states and localities. Is the commitment to them alone? Is "society" to be identified with government or authority? The service is local, and thus perhaps restricted, but the commitment is to the ideals and aspirations of education in a free society. The issue is pointed up as we ask what was, or should have been, the commitment of teachers in Republican and Nazi Germany; in Fascist Italy; in Japan under the war lords? What is it today in strife-torn nations or in nations that are underdeveloped? What commitment does the teaching profession have, here and now, with respect to any child whose chance to learn and therefore grow has been worsened by poor teaching? Above all, what kind of teaching, about what, will improve our chances of survival?

The teacher of tomorrow, like the good teacher of today, will need

--A liberal education which is organismic and not just a patchwork

--Specialized knowledge of the subject to be taught and of its supporting subjects

--Technical and professional knowledge (child development, psychology of learning, philosophy of education)

--Practice teaching under expert supervision, utilizing all appropriate devices and facilities.

These segments are not like beads on a string; they are not additive. They should form a whole which characterizes a teacher who not only possesses these attributes but also loves children.

At times we get asked, Do you agree with Conant? This question is frequently propounded as a kind of signal to see if you stand in or, on the other hand, stand out. For me, the answer is, both in and out, depending on what Conant is proposing at the time. Consider these two passages from his THE EDUCATION OF AMERICAN TEACHERS (McGraw-Hill, 1963):

> Clearly, whether teachers of the future are to teach all subjects in a self-contained classroom or are to be specialists teaching only one subject throughout the grades is profoundly significant in considering the education these teachers are to receive. What one needs is a reliable crystal ball, for prophecy must precede planning. My guess is that, in spite of all the talk about the importance of specialists in the elementary school, self-contained classrooms will continue to be the dominant pattern for kindergarten and the first three grades during the next ten years. During these years, however,

there will be an increasing tendency to use specialists in grades four through six. It follows, then, that teachers for kindergarten and the first three grades must be prepared as generalists capable of handling all the subjects appropriate for these early childhood years.

Of course, *if* the first three grades are to remain self-contained, the conclusion holds. Even so, Conant expects these teachers to be able to teach art, music and physical education along with everything else and this I find to be a dubious assignment. I feel, too, that a firmer base for later specialization in the elementary school will be found in a platform consisting of kindergarten plus Grades I and II. This might yield an organization plan of three segments, namely, Elementary School, Kindergarten, Grades I and II; Middle School, Grades III-VI; High School, Grades VII-XII--but more of this later.

Now to read Conant again:

> In my many conversations with prospective elementary school teachers of the upper grades, I found that they often think of themselves as teachers of science or of arithmetic or of social studies and are loath to take courses dealing with the teaching of art, music, physical education, or subjects other than those closely related to their special interests. One can sympathize with such a point of view, but while I suggest upper-grade teachers should develop a special teaching field, I am convinced that all elementary school teachers must have at least an introduction to the teaching of all subjects commonly taught in the elementary school.

Here and elsewhere Conant starts out boldly to swim from the shore but he insists upon keeping one foot down.

The natural question is, Why? Let us recall that the term all subjects covers the language arts, mathematics, science, social studies, music, art, physical education, and perhaps a foreign language. A case can be made for reading and writing for they are germane to all other subject matter. In fact this case is so strong that, along with general education, specialization, and professional education, nothing else need cause concern.

The plain truth is that the self-contained classroom, the self-contained teacher and the self-contained curriculum are obsolete. It is like asking for an all-purpose vehicle that will be effective under water, over the land, in the air and on toward the moon. What brings all these objects together is the concept of 20th century transportation; what brings all teachers, students and facilities together is the concept communication. The aims of travel are not to be found in the act itself, for they vary from the obnoxious (to a labor camp) to the sublime (a religious pilgrimage). The aims of communication also range from the trivial (let us say, a singing TV "commercial") to the superb (let us say, the guidance of children and youth toward life fulfillment).

III

When all the tiny test results are in, whether derived from the teacher's dogged insistence on facts to be memorized or their Skinnerian counterparts, the big question remains: What has the student learned that makes a difference--a difference in his cognitive structure, his ability to set up and solve problems, or his likelihood of reaching decisions through humane and imaginative approaches?

After all, education is preparation, as well as a series of events in day-to-day life. It is not, or should not be, the repetition of things already learned or their unthinking use in aggregative experience. Innocent mental acceptance characterizes the habit patterns of millions of American adults whose education failed to take hold. At the mercy of the slanted article or the unexamined argument, they are easily swayed by political orators, salesmen, and smooth talkers on radio and television. They lack defenses against such devices and pressures; they are undone by specious arguments and oft-repeated blandishments. They are meat for the mass-producer and for all agencies, public or private, that crave a mass-response. Such noneducation drives us, year after year, to devote vast amounts of money and energy to appearances--to slogans and escape mechanisms--as against the more lasting benefits that accrue to the free and prepared mind.

Now I hold that the self-contained classroom must carry some of the responsibility for such unhappy outcomes. Consider these observations:

1. The grade teacher of today is unlikely to go far in mathematics, science, art, or music; she (the teacher is usually a woman) has trouble keeping up with the bright students; she knows little of the future in mathematics. For example, she has no experience with and no interest in engineering.

2. The expert supervisor who comes in to share the teaching in specialized subjects has a poor ally in the classroom teacher; the plan of having these two teachers in the room together is wasteful.

3. The situation in English and the social studies is different. Most teachers in these fields go far beyond their classroom. They would regard it as silly to stay on the language level (e.g., in the fourth grade)

of their pupils; they can converse with other college graduates on a peer basis with respect to domestic and foreign affairs. This is true of conversations about the arts or even about science. (The method and substance of science are often lacking. In art, it is a lack in composing, performing, or creating. In a foreign language, it is the lack of the ability to speak fluently.) The usual outcome is to shortchange the pupils.

4. Facilities are needed that are not easy to come by in a general classroom; for example, a science room, a social studies room, language laboratories and studios.

5. Much of the activities program that surrounds and invades the self-contained classroom might better be carried on after schools hours--on weekends and during the long summer periods. Children in a good neighborhood, with the aid of social and recreational agencies get much of this outside the school; if deprived, the neighborhood itself and the whole city should do something about it. (What the school has done is at times suspect. Thus, confined to a small space, all competitive sports may be swallowed up by dull gymnastics or the ever available basketball. Neither activity leads to anything useful in later life; the one is soon abandoned ant the other sinks to spectatorship. Far better for most school children are the simple indoor and outdoor games, including softball, nature study, hikes, swimming, fishing, and camping.) Three-dimensional experience enriches the language arts and rounds out desirable traits in character and personality. The tight little world of the classroom, dominated by a single teacher, is a poor place for any child to "go all out" in activities. Other things equal (such as intelligence and education in the liberal arts and psychology), the best music teachers are musicians; the best art teachers, artists; and the best science teachers,

scientists. This phenomenon obtains outside the school; in school, we lose sight of it. Of course, I am speaking of teachers whose love and understanding of children is unrelated either to "self-contained" or specialized teaching. After all, to love music is not to hate children. Moreover, to be effective with and accepted by children (is there a difference?) is not to be one of them or even to resemble them; it is rather to respect them, to trust them, to regard them as precious and altogether the hope of the human race. We all understand this when it comes to observing baby talk, but we are often unmoved by a teacher who indulges in baby art or baby arithmetic.

So, the major item of reform in the Dual Progress Plan is the abandoment of the self-contained classroom. Under this plan, every pupil has not less than three classrooms--the core (English and social studies), mathematics-science, music-art. In a large school he may have as many as six, namely, language, social studies, mathematics, science, art, and music, together with the gymnasium in either case. It is not a case of shuffling children about although they seem ot enjoy the experience. It is a matter of joining pupil, teacher, and specialized facility as a means of encouraging learning.

Under the new plan, all teachers become, at once, (a) specialists and (b) generalists. In a large school system a teacher specializes either in the language arts or in the social studies; in smaller schools he is likely to teach in both areas. These are specializations just as much as mathematics, science, art, or music, or physical education are. For a grade teacher specializing in English, consider the range of subject matter: spelling, penmanship, grammar, reading comprehension, speech, composition, and creative writing. (Mathematics and science will often be joined as a composite specialization.) Each teacher is a generalist along two lines, namely, in the liberal arts and in those subjects pursued in depth that give technical and professional support to the art of teaching. Supporting subjects and experiences are to be found in psychology and in the history and philosophy of education; they are reinforced through practice teaching which relates the abstract or the remote to the work at hand.

The question is, "Why should we undertake the difficult business of providing two pathways for all students?"

The two paths, the graded and the ungraded, that mark student progress were not casually chosen. They exemplify the raison d'etre of the plan. There are four principal features, as follows:

1. The concept of cultural imperatives vs. cultural electives;
2. A grade system based exclusively on the language arts and social studies (the cultural imperatives);
3. A vertical, ungraded progress in mathematics, science, music and art (the cultural electives), the pupils advancing according to aptitude and achievement;
4. A reorganization of the elementary school curriculum and of teacher preparation.

What is the nature of the cultural imperatives which are regarded as so important as to determine the total grade placement of the pupil--in theory, from the first grade through the eighth? It is held that there are only two massive ingredients, namely language and the social studies. Language in this context refers to speaking, reading, and writing in English. These abilities furnish most of the general communication in contemporary society and much of its content. In fact, the common factors as between reading comprehension and mentality are so predominant that tests of general intelligence heavily depend on vocabulary, the understanding of sentences, the following of directions, and the solving of verbal problems; the tests contain little of significance in science, and nothing at all in art or music.

Since, under this plan, the whole grade system is based on the cultural imperatives, like the students themselves we must ask "for a reason." To find the reason, look around you! The English language and the social studies in our culture pattern carry almost the full weight of the common learnings, for adults as for children. It is true we are expected to show a few arithmetical skills and to have a small store of information about science, art, and music. But all the time, every waking hour, we display our skills and insights in speaking, reading, and comprehending. Occasionally we write. As for the social studies, a knowledge of history, government, and citizenship is considered so essential as to be in many states a matter of law.

Compare the situation with respect to performance in geometry, algebra, art, music, mathematics, or any branch of science; there, for the most part, adults resort to a happy neglect of science and a habit of appreciation only of the graphic and performing arts.

Beyond simple arithmetical computations, through fractions and decimals, most adults are not called upon to display either skill or insight in mathematics. For habitual users of such skills, the adding machine is the abacus of the modern world. Some residual geometry may, on occasion, be called forth, but no algebra, trigonometry, or analysis. Certainly elementary statistics as far as graphs, sampling, dispersion, and correlation, would prove valuable to high school graduates, but that is precisely the type of mathematics our schools have neglected. I am not referring to the preparatory work of scientists and technicians but to the general cultural attributes of the adult population of the United States. We read about science, we follow its more glamorous trajectories as in nuclear reactions or space travel, but we choose to remain indifferent to scientific methods and techniques. Of course, in the future, the social climate may change. It may be that we shall one day substitute a genuine grasp of science pitched to various levels of comprehension. Right now even the superior American adult is a long way from that. He is as ill at ease in science as he is in machine design, musical composition, or a foreign tongue. Given a massive cultural shift, we would expect the imperatives to follow suit.

Now, by placing mathematics and science in the vertical or ungraded segment, we do not thereby reduce their importance either for the individual child or for the nation. We simply recognize and incorporate in the school plan some fundamental differences in level of expectation. Up to a point of no return as evidenced by intellectual confusion and emotional blocking, every student has both mathematics and science every day--but he takes it with a teacher who knows what he is talking about and under favorable conditions. There is no allowance for evasiveness or sloppiness, but neither is there the dread feeling that, come what may, he connot excape what he, as a student, is unable to master and what, as an adult, he will never use.

Is such a plan the mark of the future in elementary education? It is too early to tell. Thus far only about 15 school systems have tried it and only a few for any length of time. This we know: the students like it, the parents like it and the teachers, at first divided in their attitudes, for the most part prefer not to return to the self-contained classroom. In terms of measured outcomes, there is not much to be said, pro or con. While there are favorable signs for above-average children, we have run into a difficulty yet to be surmounted, namely, that standardized tests are not designed to measure complex learning and exploring. To discover talent far down in the grades and nurture it expertly year after year in an ungraded sequence, will call for new types of longitudinal evaluation. At the same time, to "take the heat off" a captive student demonstrably out of his depth, strikes some teachers as subversive.

At the start, in the back of your minds--and now in front--must be the nagging question, why not go all out for a nongraded school? As you know, a substantial number of school systems are doing just that, usually in combination with team teaching. The results are promising. (For a comparison of all such plans I recommend the book entitled TEAM TEACHING under the editorship of Shaplin and Olds.)

The difference between the nongraded plan and the dual progress plan does not lie in their amenability to team teaching nor in utilizing new concepts of learning and evaluation. After all, half the day in the dual progress plan is devoted to nongraded teaching. The real difference is in their respective rationales. John Goodlad and others would sweep out the grade system. I prefer to keep it, but on sensible grounds. The basis is found in the so-called cultural imperatives--what every student and adult should master up to the level of his competence and energy. This type of grade and grade promotion may be worth keeping. Thereby you retain a series of plateaus or change-over points; you know where Johnnie "is" in school without having to analyze a profile chart. You sense a readiness (or nonreadiness) for the subsequent high school program. The students themselves like to climb steps--not just to climb a ladder without rungs. Of course to call for "grade-equivalents" in a nongraded school is to reveal a weakness in the plan, whether we refer to tests, promotions, or the transfer of students to another school.

The main thing for the schools of tomorrow is to free the teacher from impossible demands. This goal characterizes most academic innovations. We seek a teacher who is liberally educated, professionally competent, advanced in at least one subject, and, through teaching assistants, teaching devices and school facilities, free to concentrate upon the needs and aspirations of the students. There remain such matters as curriculum construction, supervision, research and the over-all policy of the school board as a representative of the people. When all these go together, not in unanimity but in harmony, we come close to the concept of the Great School Society of the future.

IV

A pioneer in instructional television, Dr. C. R. Carpenter of the Pennsylvania State University, recently reported the research findings on teaching by television. He states.

> A bold way to summarize the general results is to say that if comparisons are made between televised and direct teacher-to-student instruction, and the only difference of the conditions is the use of television, and the results show that one treatment, either the televised or direct instruction is significantly better or poorer in terms of measured learning, something was wrong with the experiment. The facts seem to be that the effects of television as a variable operating in a field of perhaps hundreds of other potent variables, is of minor significance. Therefore, no significant differences in results are to be expected. (Research on Instructional Television, Brandeis University, 1963, mimeo.)

Carpenter goes on to say:

> Perhaps the greatest limitation imposed on instructional television research has been the quality of the programs which have been available for

> use in experimentation. Conventional classroom instruction, even at its best, usually fails to apply systematically and fully learning theory and principles. . . . Television should be understood basically as a means or mechanism for accepting, distributing, and presenting stimulus materials or information. It is the program or stimulus materials which have the possibilities of instigating learning and not the carrier of them. (Ibid.)

The 400 research reports referred to by Carpenter tell us something on the positive side, namely,

(1) When the conditions of learning have been properly met, students do learn through television--over a wide range of difficulty and subject matter. For example, medical students, as never before, may follow the details of a delicate surgical operation and review it later from color film.

(2) There are factors of cost, availability, and student motivation that may be decisive even if no other advantages accrue to televised instruction. There is, for example, indirect learning. This is exploited in commercial television but rather neglected by educators. The engendering of attitudes that lead to substantial shifts in decisions and behavior patterns illustrate this learning principle.

On the whole, it is rare to find a solid application of contemporary learning theory in any educational milieu--classroom instruction, lecture, programming, films or television. Saturated with applied science elsewhere, we teach hit-or-miss. Doubtless education can never be as objective and predictable as the physical sciences for it incorporates complex variables in a system of values. To education we assign aims and a conscience. Still, we should utilize scientific principles wherever they undergird teaching, and go on from there.

Perhaps all teachers could learn something from the experience of teachers of agriculture, the mechanic arts, physical education, and military science. There the aims are not so flowery, but the measures of success or failure are forthright. You do or you don't; if you do things wrong everybody senses it and you may get hurt. It is easy to orate about the limitations of this form of education. It is indeed narrow and it is not sufficient. But its opposite extreme, dilettantism, which runs rampant in most school systems, is rarely inveighed against. Straight up through college we tend to identify liberal education with general education and general education with bits and pieces. What really frightens us is expertness in any field, at any level, under any conditions--a remnant from the bedraggled skirts of the pseudo-progressives. We close vocational schools and dilute the vocational offerings in comprehensive high schools, thereby depriving thousands of students of any marketable skills. Yet for every doctor, dentist, or engineer, and in every industrial and business enterprise, there is a steady demand for the graduate or dropout who is not only _adaptable_ (a "good" word) but also _skilled_ (a "bad" word). In the future we should be able to combine the liberal, but not too abstract, with the practical in such a way as to keep open both the vocational and professional channels. In fact, for _any_ student it makes sense to combine thinking and doing, and to respect them both.

V

In my opinion--there is an element of wishful thinking in it--the schools of tomorrow will move toward a year-round plan that includes a merger of outdoor recreation and outdoor education. While the underlying principle is not new, in our grandfathers' time it was considered sinful, namely, that learning could be enjoyable and exciting.

Back in 1960 the American Association of School Administrators set the stage. In its brochure entitled YEAR-ROUND SCHOOL we read:

> School vacation: June, July, and August. These are the months when school plants in nearly 40,000 districts are closed up and standing idle, when a million or more teachers are out of work or are employed in temporary jobs, and when millions of children have time on their hands. This is not an unusual situation; it is commonplace; it is traditional. It reflects the conception deeply imbedded in the minds of American people of what schools ought to do and how schools ought to be operated and for how long.
>
> The chief exceptions to this practice thus far are found in federally supported programs in agriculture, home economics, and the distributive occupations. Provisions for make-up work, for music, arts, crafts, and recreation are also fairly common. Of course many teachers themselves go back to school.

With respect to the idea of a voluntary summer program, the A.A.S.A. authors become enthusiastic:

> The greatest advantage probably would be in enrichment. Gifted children might take advanced courses in chemistry, physics, mathematics, creative writing, or painting (or) take part in a great books seminar. Others would take courses such as personal typing, nature study, woodworking, music, crafts, or shorthand. There would be opportunities for special work in foreign languages.

To me, such a program, if enhanced by new activities in outdoor education and recreation, might well become the standard of comparison. It is compatible with the full-year employment of teachers; if successful, it would place summer educational costs on a sound basis for public support.

Since there are no compulsory summer programs and there is much fluidity in planning and practice on a voluntary basis, the way is open for radical innovations. As a start, we might ask some freewheeling school systems to try the following plan:

(A) A "regular" school year of 175 days of attendance (5 days per week for 35 weeks) to extend from September 15 to June 1, two weeks to be given to the holiday seasons. This holds for all students, Grades I to XII.

(B) For the junior and senior high school students, or for all students in Grades VII-XII, add one calendar month (20 days of attendance) to taken during the period June 1 to September 15, with full state and federal aid if and when available. Each teacher, on an annual salary basis, would teach two such months. This plan would allow upper division students two and one-half free summer months and teachers a vacation of one and one-half months. The students would be offered two options for this summer session:

(a) A month at camp devoted to outdoor education and recreation under expert supervision, or

(b) A special summer program in the community consisting of indoor-outdoor education. It would be based on a systematic selection from the following: motor skills, games, demostrations (including films, filmstrips, and educational TV), short hikes, arts and crafts, nature study, music, dramatics, and the dance, together with visits to zoos, parks, museums, galleries, historic sites and nearby natural scenes.

(c) For Grades III-VI, the elementary grades, only option (b) above would be offered, again with full public aid.

(d) For Grades I and II, the regular school year of 175 days would be offered, supplemented by 5 (or more) days in spring or summer to meet the standards of the respective states for length of the school year. These extra sessions would resemble option (b), with the parents free to join their children or to observe.

Since there are not enough camps to meet the probable demand for option (a), there would need to be granted the legal power to rent camps from agencies, to establish temporary facilities, and to acquire permanent camps. (Some states have already granted powers along these lines to local school systems.)

With this nine and a half month plan fully in effect there could be -

(1) New elasticity and richness in the curriculum.

(2) An interesting deployment of the teaching staff.

(3) A greater demand for specialists.

(4) A fuller use of the facilities of the school and other community resources.

(5) A summer educational aid to parents, without interference with normal vacation plans.

(6) A better opportunity to enlist parents and others in the understanding of children.

This program would cost money, but there would be some "savings." The school plant would be used more extensively. The teachers need and should have a 12 months' salary, in any case.

The camps could be less elaborate or expensive than agency or private camps; for one thing, the children are already classified and organized in groups, and there would be no problem of selection among applicants. School buses should be made available, together with some types of equipment, as in science and physical education. There is enough experience with school camps, for example, in Michigan and California, to supply a working basis for costs, facility needs, and the types of programs deemed desirable.

If this type of education and recreation is good for children and youth--as many families and agencies firmly believe--it is fair to ask communities, aided by the states and U.S. Government, to bring it like the rest of public education to every child. The research will be slow to come in, but the experience of schools that have moved in this direction is reassuring. This merging pattern of outdoor recreation and education at least carries the promise of a more exciting life for young and old alike. It is consistent with the burgeoning projects backed by new federal funds including plans for the conservation of natural resources. Are not the children themselves, now and always, our greatest natural resource? For my money--for every taxpayer's money--it would be hard to dream up a more rewarding educational enterprise!

Clocks do not run backward, but their moving hands keep pointing to the same numerals. My first paper on education was published in Educational Supervision and Administration 38 years ago. It was entitled Extending the Schools Downward. Of course, at the University of Iowa we were already committed to preschool education. All four of my Iowa-born children went to the so-called Laboratory School full-time at the age of three. On both theoretical and practical grounds, the Iowa staff felt that the program was good. (It was too early to surmise that the I.Q.'s would go up.) What we did observe was (1) that behavior was improved, (2) that learning was facilitated, (3) that research was encouraged, and (4) that the parents, through child observation and correlated programs of adult education, were stimulated.

Subsequently in the depression years under Harry Hopkins' plan for emergency nursery schools, some of us were privileged to offer such programs on a national scale.

So we come full circle to 1965, the National Education Year, and to its present ramifications.

Thus far formal education can scarcely keep up with competitive activities. As I said a short time ago in New York:

Allowing 182 out of 365 days to formal schooling and noting that one half the waking time of each child while attending school is spent out of school, we come abruptly upon a sobering thought: in the preschool years the family and neighborhood carry 100 per cent of the educational load; during school years they still carry 75 per cent of the load. Hence the need for a sound education of the child at home and of the parents is urgent. And this is not all. It may be that, if Benjamin Bloom is right in his hypotheses, this preschool period accounts for as much variance in tested intelligence as all the remaining years of childhood and adolescence. To neglect the young child is to invite a progressive slowdown in intellectual attainment.

The national education program carried on last summer on behalf of over 500,000 underprivileged preschool children is indeed a Head Start. If the movement spreads, I predict a lifting of the fog that has settled over so many discussions of inferiority due to race, nationality, or parental status. Children differ from one another in their inherited structures, but this cannot be determined by extrapolation from external categories.

In my opinion institutes and research centers would do well to take all such formulations out of the realm of hypothesis, intuition, and demonstration to the rare atmosphere of objective research, using good techniques in sampling, matched grouping, and correlation. The question is, what do we expect children to know, to do, to be, and to become. Thus far, as inquisitive followers of Binet, Piaget and Lewin, we have only mapped out the problems. As you know, the map is not the territory.

For other aspects of "new" subject matter, methods, buildings, facilities and systems we might paraphrase ANIMAL FARM: tested innovation, good; untested innovation, bad. For example, some distinguished mathematicians are dubious about the "new math." Other critics ask, who wants to speak French (in Greenwich Village where I live, Spanish is good for a sneer). A frustrated Pressey asks how long shall we be burdened with thousands of expensive frames and branches that seem to follow "Parkinson's Law."

We come at last to the kernel of my remarks today--let's find out. There will always be a place for imagination and adventure--for the art of education which goes beyond facts to the examined life. Contemplating the schools for tomorrow, we discern incredible power in terms of time, money and men. Government agencies will help us to be scientific and technical within the limits of such disciplines. Who but ourselves, alone and in small teams, can run the risk of breaking down walls?

5.

THE UNIVERSITY OF GEORGIA
Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

PSYCHOLOGICAL SCALING AND EDUCATIONAL RESEARCH*

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PAIRED COMPARISONS

Edwards, A. L. (1956) A Technique for Increasing the Reproducibility of Cumulative Attitude Scales. Journal of Applied Psychology, 40:263-265.

Edwards described a technique for increasing reproducibility of cumulative attitude scales by the method of paired comparisons. Using this technique it was possible to construct attitude scales with a relatively high degree of reproducibility and satisfactory reliability.

Guilford, J. P. (1928) The Method of Paired Comparisons as a Psychometric Method. Psychological Review, 35:494-506.

A short-cut method by which one may find scale values that correlate almost perfectly with values found by means of Thurstone's method.

Gullickson, H. (1946) Paired Comparisons and the Logic of Measurement. Psychological Review, 53:199-213.

Gullickson presented a broader definition of measurement than that given by other writers and showed that scales constructed by the method of paired comparisons would satisfy this broader definition of measurements.

Gullickson, H. and Tucker, L. R. (1961) A General Procedure for Obtaining Paired Comparisons from Multiple Rank Orders. Psychometrika, 26:173-183.

A method of using multiple-rank-order was proposed to reduce the number of judgments required of the subjects while obtaining information on each possible paired comparison.

Jones, L. V. and Jeffrey, T. E. (1964) A Quantitative Analysis of Expressed Preferences for Compensation Plans. Journal of Applied Psychology, 48:211-214.

Two experimental studies were carried out by the method of comparisons to evaluate employee preferences for alternative forms of job compensation studies yielded interpretation in terms of monetary-value equivalents of the compensation features.

McCormick, E. J. and Bachus, J. A. (1952) Paired Comparison Ratings I. The Effect on Rating of Reductions in the number of Pairs. Journal of Applied Psychology, 36:123-127.

A study to investigate the extent to which it would be possible to use reduced number of pairings and still achieve essentially the same ratings results as would be obtained from a complete pairings.

McCormick, E. J. and Roberts, W. K. (1952) Paired Comparison Ratings II. The Reliability of Ratings Based on Partial Pairings. Journal of Applied Psychology, 36:188-192.

A study to examine the reliability of partial pairing techniques as applied to employee ratings. Using the paired comparison system, the reliability of ratings obtained with partial pairings tended to decrease systematically with the reduction in the number of pairs per individual on which the ratings were based.

Mosteller, F. (1951) Remarks on the Method of Paired Comparisons: I. The Least Squares Solution Assuming Equal Standard Deviation and Equal Correlations. Psychometrika, 16:3-9.

Mosteller showed that the assumption of zero correlations between pairs of stimuli in Thurstone's Case V could be relaxed to an assumption of equal correlations between pairs with no change in method.

Mosteller, F. (1951) Remarks on the Method of Paired Comparisons: II. The Effect of an Aberrant Standard Deviation when Equal Standard Deviations and Equal Correlations are Assumed. Psychometrika, 16:203-206.

A study to investigate the effect of an aberrant standard deviation on the Thurstone's Case V solution. It was shown that changing one of the standard deviations affected only the position of the stimulus with the aberrant standard deviation.

Ross, R. T. (1934) Optimum Orders for the Presentation of Pairs in the Method of Paired Comparison. Journal of Educational Psychology, 25: 375-382.

Author proposed a general method for finding the optimum, balanced orders for any number of stimuli in paired comparisons which has the following advantages: (a) to maintain the greatest possible spacing between pair's involving identical numbers, (b) to remove time and space error, and (c) to avoid regular repetitions.

Thurstone, L. L. (1927) A Law of Comparative Judgments. Psychological Review, 34:273-286.

Thurstone described the law of comparative judgment and showed some of its applications in the measurement of psychological values. This law was considered under five cases which involve different assumptions and degrees of simplification for practical use.

Wherry, R. J. (1938) Orders for the Presentation of Paired Comparison. Journal of Experimental Psychology, 23:651-660.

A study to compare the empirical method with Ross's rational method for ordering in presentation of paired stimuli. It was shown that the Ross's lists are not optimum in all senses and a list can be empirically devised which is superior to the list obtained by the rational method.

Witryol, S. L. (1954) Scaling Procedure Based on the Method of Paired Comparisons. Journal of Applied Psychology, 38:31-37.

An experimental comparison of Thurstone's Case III and Case V, and Guilford's short-cut method to scaling paired comparison data. The scale values obtained by three methods were essentially the same.

Witryol, S. L. and Thomson, G. G. (1953) An Experimental Comparison of the Stability of Social Acceptability Scores Obtained with the Partial-Rank-Order and the Paired-Comparison Scales. Journal of Educational Psychology, 44:20-30.

The relative stability of social acceptability scores obtained by the partial-rank-order and the paired-comparison scales were compared. The paired-comparison scale yielded higher stability coefficients than the partial-rank-order scale.

SUCCESSIVE INTERVALS

Bending, A. W. (1954) Reliability and the Number of Rating Scale Categories. Journal of Applied Psychology, 38:38-40.

A study of relationship between the number of rating categories and test-reliability or rater-reliability. There was no consistent trend in the relation of test-reliability and the number of scale categories, or rater-reliability and the number of categories.

Edwards, A. L. (1952) The Scaling of Stimuli by the Method of Successive Intervals. Journal of Applied Psychology, 36:118-122.

Edwards proposed a method of scaling which has the following properties: (a) it requires only a single judgment from each subject for each stimulus, and (b) it yields scale values which are linearly related to those obtained by the method of paired comparisons.

Guilford, J. P. and Dingman, H. F. (1955) A Modification of the Method of Equal Appearing Intervals. American Journal of Psychology, 68:450-454.

A procedure was described which is aimed at elimination of the end-effect in the method of equal-appearing intervals. The correlation between scale values for stimuli computed by the method of successive intervals and equal-appearing intervals was very high.

Kelley, H. H., Hovland, C. I., Schwartz, M., and Abelson, R. P. (1955) The Influence of Judges' Attitudes in Three Methods of Attitude Scaling. Journal of Sociological Psychology, 42:147-158.

Kelley and others investigated whether Negro judges were able to make distinctions among the unfavorable attitude statements by the method of paired comparisons, and whether the failure of the method of equal-appearing intervals to discriminate among these statements might be overcome by the method of successive intervals.

King, D. J. and Lan, A. W. (1963) A Comparison of Three Scaling Techniques in Estimating the Accuracy of Written Recall. Journal of General Psychology, 69:203-207.

A study to compare three scaling techniques in estimating the accuracy of written recall. Fifteen written recalls of a story were scaled by (a) successive intervals, (b) rank-order method, and (c) paired comparisons.

RATIO SCALING

Baker, K. E. and Dudek, F. J. (1955) Weight Scales from Ratio Judgments and Comparisons of Existent Weight Scales. Journal of Experimental Psychology, 50:293-308.

Two experiments were carried out with nine weights to study various aspects of characteristics of ratio judgments in the constant-sum method. These scale values were compared with existent weight scales obtained by various pychophysical methods.

Baker, K. E. and Dudek, F. J. (1957) Scaling Line-lengths with a Modification of the Constant-sum Method. American Journal of Psychology, 70:81-86.

To investigate the scaling of line-lengths using a modified method of the constant-sum scaling. Subjects divided 100 points into the standard line (the shortest) and each of the ten paired lines. Obtained psychological scale values were highly reliable, but were underestimates of the physical values.

Comrey, A. L. (1950) A Proposal for Quantitative Reporting of Comparative Judgments. Psychometrika, 15:317-325.

The author proposed a method of ratio scaling based on comparative judgments of paired stimuli and showed the solution of a simple problem. At least an ordinal scale was derived by this method and the scale had some of the characteristics of ratio scales.

Dudek, F. J. (1959) A Comparison of Scale Values for Adverbs Determined by the Constant-sum Method and a Successive Intervals Procedure. Educational and Psychological Measurement, 19:539-548.

Dudek compared scale values of common adverbs determined by the method of successive intervals and the method of constant-sum scaling. There was good agreement between two scale determinations as far as ordering the adverbs was concerned. In addition there were consistencies with the respect to distance between adverbs.

Dudek, F. J. and Baker, K. E. (1956) The Constant-sum Method Applied to Scaling Subjective Dimensions. American Journal of Psychology, 69: 616-624.

Two experimental studies were made to apply the constant-sum method to subjective dimensions. All subjects agreed on the rank order of the sand papers (roughness), and two groups of men agreed quite closely with respect to the order of neckties (preference).

Dudek, F. J. and Katherine, B. E. (1957) On the Validity of the Point-Assignment Procedure in the Constant-sum Method. American Journal of Psychology, 70:268-271.

A study to investigate the extent to which particular procedures used for reporting judgments in the constant-sum method may themselves affect the scales. Almost identical scale values were obtained for lifted weights by a method utilizing point-assignments and by a method which allowed expression of perceived ratios without use of numerical values.

Dudek, F. J. and Thoman, E. (1964) Scaling Preferences for Television Shows. Journal of Applied Psychology, 48:237-240.

A consistency of scale values from one sample to another for dimension of preference by the constant-sum scaling technique. Eighteen television shows were selected as stimuli to be scaled. Very high correlations between scale values for two groups were found.

Engen, T. (1956) An Evaluation of a Method for Developing Ratio Scales. American Journal of Psychology, 69:92-95.

A study of the effects on the psychological scale that were produced by variations (a) in the size of the range over which the stimuli were distributed and (b) in the absolute magnitude of the stimuli.

Metfessel, M. F. (1947) A Proposal for Quantitative Reporting of Comparative Judgments. Journal of Psychology, 24:229-235.

Metfessel described the fundamental principles of the constant-sum method for the purpose of obtaining psychological values on ratio scales. Limitations were carefully considered.

SCALOGRAM ANALYSIS

Festinger, L. (1947) The Treatment of Qualitative Data by Scale Analysis. Psychological Bulletin, 44:149-161.

A critical review of the published literature and some unpublished materials with reference to the theory of scale analysis. He made several suggestions to improve the method.

Guttman, L. (1944) A Basis for Scaling Qualitative Data. American Sociological Review, 9:139-150.

A non-technical discussion of what he means by a scale, and a proposal of a new approach for quantifying the qualitative data (scalogram analysis).

Kriedt, P. H. and Clark, K. E. (1949) Item Analysis versus Scale Analysis. Journal of Applied Psychology, 33:114-121.

A comparison of the Guttman's technique with two older methods of item analysis in order to determine the comparative value of each method. Scale A was made by selecting 10 items whose intercorrelations with each other would be maximized, Scale B was made up of 10 items with highest correlations with the total score, and Scale C consisted of 10 items selected by scale analysis.

Lesser, G. S. (1958) Application of Guttman's Scaling Method to Aggressive Fantasy in Children. Educational & Psychological Measurement, 18:543-551.

Lesser applied scale analysis technique to study the scalability of fantacy aggression responses of a sample of pre-adolescent boys. The result indicated the feasibility of applying this technique to projective measures.

Mosel, J. N., Fine, S. A. and Boling, J. (1960) The Scalability of Estimated Worker Requirements. Journal of Applied Psychology, 44:156-160.

Seven experienced and trained job analysists rated 50 jobs on 33 trait requirements grouped into three classes: (a) aptitudes, (b) interests, and (c) personality. Applying scalogram analysis, they found that interest requirements meet the criterion of acceptable reproducibility most, and aptitude requirements least.

Schessler, K. and Strauss, A. (1950) A Study of Concept Learning by Scale Analysis. American Sociological Review, 15:752-762.

They applied scale analysis to study the sequential stages in the child's understanding of the concept of money and the distinctive features of each stage.

Shultz, D. G. and Siegel, A. I. (1961) Generalized Thurstone and Guttman Scales for Measuring Technical Skills in Job Performance. Journal of Applied Psychology, 45:137-142.

To investigate whether technical proficiency criterion measurement instrument could be constructed which can be applied across several related job specialties and which can be scaled by both Thurstone and Guttman techniques.

Strauss, A. and Schuessler, K. (1951) Socialization, Logical Reasoning, and Concept Development in the Child. American Sociological Review, 16:514-523.

Scalogram analysis was used to test the hypotheses (a) a child's concept of money develops in a consistent and cumulative manner, (b) there is no difference between the performance of working-class children and those of business-class children. Both hypotheses were accepted.

Wohlwill, J. F. (1960) A Study of Concept Learning by Scale Analysis. Journal of Genetic Psychology, 97:345-377.

A study to investigate the developmental process by which children arrive at an abstract concept of number by scalogram analysis. The finding justified the postutation of a single scale of conceptual complexity underlying several tasks which children performed.

MULTIDIMENSIONAL SCALING

Abelson, R. P. (1954) A Technique and Model for Multidimensional Attitude Scaling. American Psychologist, 9:319.

Abelson suggested a scaling procedure which could produce multidimensional attitude maps for either a single subject or for groups of subjects. The method requires that each subject judges the similarity of the members of pairs of attitude statements. He applied this technique to 114 subjects for 12 attitude statements dealing with war, armaments, and communism.

Jackson, D. N., Messick, S. J. and Salley, C. M. (1957) A Multidimensional Scaling Approach to the Perception of Personality. Journal of Psychology, 44:311-318.

A study to investigate the relevance and appropriateness of multidimensional scaling for studying the perception of personality. Using 20 college male students who were well acquainted with each other, four dimensions were extracted, three of which accounted for major portion of the variance--theoretical-intellectual, friendship, and age-status.

Messick, S. J. (1956a) An Empirical Evaluation of Multidimensional Successive Intervals. Psychometrika, 21:367-375.

An empirical study to compare the multidimensional successive intervals with the method of complete triads. Two methods were applied to similarity judgments of Munsell colors varying in brightness, saturation, and hue. Both methods yielded configurations that correlate highly with the Munsell color structure.

Messick, S. J. (1956b) The Perception of Social Attitudes. Journal of Abnormal and Social Psychology, 52:57-66.

Messick studied whether a set of perceived attitude relationships could be adequately represented in dimensional terms, and investigated whether two groups which differ with the respect to these attitudes perceive them as being structured in different ways.

Richardson, M. W. (1938) Multidimensional Psychophysics. Psychological Bulletin, 35:659-660.

An extension of traditional psychophysical method to more than one dimension. Judgments of similarity of nine colored cards arranged in triadic combinations provided scale-distances between all pairs of stimuli. A theorem concerning the rank of a certain matrix was adapted as a criterion for determining the number of factors involved in the similarity judgments.

Shultz, D. G. and Siegel, A. I. (1964) The Analysis of Job Performance by Multidimensional Scaling Technique. *Journal of Applied Psychology*, 48:329-335.

Investigation of the feasibility of applying the multidimensional scaling procedure to the analysis of job performance. Four dimensions were identified in a specific Naval job and these dimensions appeared to be amenable to unidimensional scaling.

Torgerson, W. S. (1952) Multidimensional Scaling: I. Theory and Method. *Psychometrika*, 17:401-419.

To describe a set of analytical procedures for each of three steps of multidimensional scaling technique, including a least-squares solution for obtaining comparative distances by the complete method of triads, two practical methods for estimating the additive constant.

Young, G. and Householder, A. S. (1938) Discussion of a Set of Points in Terms of Their Mutual Distances. *Psychometrika*, 3:367-375.

They described the necessary and sufficient conditions for a set of numbers to be the mutual distances of a set of real points in Euclidean space, and found the matrices whose ranks determine the dimension of the smallest Euclidean space containing such points.

6.

THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

RESEARCH INVOLVING THE* WECHSLER INTELLIGENCE SCALE FOR CHILDREN

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RESEARCH INVOLVING THE WISC

INTRODUCTION

The publication of the Wechsler Intelligence Scale for Children in 1949 was a momentous event in the field of evaluation at the primary level. The WISC was a natural extension of the well-known Wechsler-Bellevue Intelligence Scales, and, in fact, is composed largely of items from Form II. The WISC extended the Wechsler scales down to the chronological age of 5 and is intended for use with children from ages 5 to 15 (Wechsler, 1949, p. 1).

The WISC, like the Wechsler-Bellevue scales, consists of twelve tests, which are divided into two groups--verbal and performance. The verbal tests are Information, Comprehension, Arithmetic, Similarities, Vocabulary, and Digit Span. The performance tests are Picture-Completion, Picture Arrangement, Block Design, Object Assembly, Coding, and Mazes. Frequently Digit Span and Mazes are not used.

One feature of the WISC research literature is striking. A large amount of research involving the WISC has been conducted on below average subjects, especially retardates. This review is weak in that too little research on subjects with the full range of ability is included. This problem reflects a common use of the WISC--*i.e.*, it is used frequently for testing subjects who are suspected of being of exceptionally low intelligence. In many studies one gets the impression that the paper was prompted more by the availability of data on retardates than by the need to test specific hypotheses.

One feature of the review was especially pleasing. Considerable research deals with the relationship of the WISC to reading achievement and reading problems. These articles are of primary interest to most of the conferees.

The review is roughly divided into two sections--papers dealing with unselected (full-range) subjects and papers dealing with subjects from the lower end of the distribution. These two major divisions are sub-divided, as far as possible, into several subsections. Both major divisions include sections on WISC characteristics and WISC correlates. The division dealing with the mentally handicapped also contains a section concerning the diagnosis of mental retardation.

THE USE OF THE WISC WITH TYPICAL SUBJECTS.

This section reviews studies involving the WISC in which the subjects have a full range of intelligence.

Characteristics of the WISC

It seems appropriate to review some of the characteristics of the WISC as reported in Wechsler's manual (1949). The original norms were based on a total of 2200 Caucasians in a carefully stratified sample.

Reliabilities and standard errors were reported at three age levels--7-1/2, 10-1/2, and 13-1/2. The reliabilities tended to be lower for the younger group. The corrected split-half coefficients ranged from .59 (Digit Span) to .91 (Vocabulary) for the 10-1/2 year-old group. Davis (1964, p. 399) points out that these subtest reliabilities are such that a difference of three or four points between scaled scores on any subtest are required before a difference can be treated as significant. The total scores yielded reliabilities of .88 to .96 for Verbal, .86 to .90 for Performance, and .92 to .95 for Full Scale.

Cropley (1964) reports two-year stability coefficients. The highest test-retest coefficient was .50 (Comprehension) while the lowest was .12 (Coding). The average subtest reliability was .43 for verbal tests and .32 for performance tests. The subjects tested were ten years old at the time of the first testing.

The intercorrelations of all scales were reported at each of the three age levels. No factor structures were presented, but the patterns of correlations for the three age groups appear, to the writer, to be substantially different. The correlation between Verbal and Performance ranged from .56 to .65.

Empirical data concerning validity were not given in the manual. However, considerable validity data is available on the adult scales (Wechsler, 1958).

Two articles presented factor analyses of the WISC subtests. Cohen (1959) factored the WISC intercorrelation matrices reported in the WISC manual (Wechsler, 1949). His analyses resulted in five oblique factors at each age level. Second-order factoring resulted in a general factor that accounted for about one-half of the reliable variance of the battery. He found that younger children exhibited a smaller degree of generality of functioning than do adults.

Osborne (1964) reports factor structures for Negro pre-school subjects. Osborne's results were similar to those of Cohen inasmuch as the first two factors--verbal comprehension and perceptual organization--were the same. However, later factors appeared to be different. Differences can be partially attributed to differences in statistical methodology as well as race. Osborne has followed up his subjects and is preparing a report of the longitudinal development of the factor pattern. Cohen's data, of course, is cross sectional.

Relationships of WISC and Other Variables

Other Tests. The WISC has a high positive relationship with the Stanford-Binet (SB), but evidence indicates that the scores cannot be treated as equivalent. Davis (1963, p. 391) presents the following correlations of the WISC with the SB: Verbal, .71 to .83; Performance, .57 to .64; and Full Scale, .76 to .80.

Considerable attention has been given to the question of equivalancy of WISC and SB scores at various age levels. The consensus opinion is that SB scores are higher than WISC scores at the upper ranges, but the reverse is usually true at the lower range. The evidence is contradictory to some degree, and this is not surprising since Terman reports different standard deviations at each age level (Terman and Merrill, 1937, p. 41) while the WISC standard deviation is scaled to the same value at each age level. The SB norm standard deviation fluctuates from 12 to 20 while the WISC remains exactly 15 for various age levels. The articles reviewed were Guthrie and Pastovic (1951), Krugman, et al (1951), Nale (1951), and Triggs and Carter (1953).

DeLattre and Cole (1952) related the WISC to the Wechsler-Bellevue Form I (WB). Subtest correlations were as low as .19 (Picture Arrangement) to as high as .71 (Digit Span). The IQ measures were quite similar on both WISC and WB, however scores tended to be higher for WISC (but this could have been a practice effect).

Socioeconomic Status. Cropley (1964) noted significant scale score differences between high and low socioeconomic groups. Differences were apparent on only the verbal scales.

Reading. Although intelligence and reading ability are highly and positively correlated, the correlation is not perfect. Many studies deal with reading as an intelligence correlate without regard to general ability level. The first several articles are concerned with the identification of reading difficulty or characteristics of poor readers.

Robeck (1964) compared WISC profiles of poor readers to the test norms. Poor readers were found to be significantly weak in Information, Arithmetic, and Digit Span. They were significantly high in Comprehension, Similarities, and Vocabulary. He concluded that the poor reader is handicapped in the use of context clues for word recognition; he is high in verbal areas involving judgment and ability to generalize; he is weak in the ability to recall specific verbal material; and he tends to deal more effectively with figural than symbolic content.

The use of test norms as reference values makes these results rather tentative; however, they are important. The conclusions should be quite helpful in the construction of remedial materials. More work needs to be done in the matching of abilities to remedial materials.

The general pattern defined by Robeck (1964) is supported to a large extent by earlier studies. Kallos, Grabow, and Guarino (1961) also analyzed a group of poor readers and determined Block Design to be significantly high, while Information, Coding, and Arithmetic were significantly low. The high Block Design mean is of considerable interest and deserves additional study. The authors hypothesized that motor-visual skills may be a primary cause of reading disability, while the low Information and Arithmetic scores could reflect poor home or school environments.

Burks and Bruce (1955) also found the same factors low for poor readers (Information, Arithmetic, and Coding) while the poor readers were high in Picture Arrangement, Block Design, and Comprehension. Burks and Bruce based their conclusions on a comparison of poor readers with a group of good readers, rather than norm values. The good readers were atypically high on Similarities. These writers believe that poor readers approach reading from a more concrete manner because they cannot handle abstractions (which is necessary for Arithmetic and Coding).

Even earlier, Graham (1952) had identified the poor-reader low areas as Arithmetic, Digit Span, Information, Digit Symbol, and Vocabulary. Test scores above the mean were Object Assembly, Picture Completion, Picture Arrangement, Block Design, Comprehension, and Similarities. Graham points out that the poor-reader profile is similar to Wechsler's adolescent psychopath profile. Moreover, the poor reader appears to experience his greatest success in areas most distant from classroom situations. (Digit Symbol most closely resembles the original reading learning situation.)

These four papers present quite a consistent description of the poor reader. Each study involved children average in general ability, but low in reading achievement. These children appear to have some areas of strengths (Comprehension, Similarities, and several Performance areas) and distinct areas of weakness. These latter seem to fit two categories--weakness in dealing with symbolic content (Arithmetic, Digit Symbol, and Coding) and weakness in environmental stimulation (Information and Arithmetic). One can quickly attack the second area by projects such as

Headstart and the Research and Development Center. However, the first area is tougher. We need to either do a better job in teaching abstract symbol use, if this is possible, or try to build learning materials that deal less with abstract content and more with concrete content.

Two other unrelated articles bear on the relationship of the WISC to reading achievement. Neville (1965) showed that poor readers were lower than average and good readers on the Verbal scale, but not on the Performance scale. This supports the above papers, but the comparison in terms of gross measures instead of subtests makes it less useful than the others. This paper also showed that poor readers were low on the Lorge-Thorndike Verbal Battery, but not on the Peabody Picture Vocabulary test.

Ames and Walker (1964) tried to predict reading achievement from the WISC and the Kindergarten Rorschach. The Rorschach was administered before reading training and did have some predictive value. The authors point out that the variables that change the most between the ages of two and ten are the variables that best distinguish good and poor readers. This research, coupled with Graham's observation that poor readers yield Wechsler's adolescent psychopathic pattern on the WISC subtests, indicate a great need for research on non-cognitive correlates of reading.

THE USE OF THE WISC WITH SUBJECTS OF LOW ABILITY

This part of the presentation reviews research conducted on below-average subjects. Most of these studies involve retardates--frequently these are institutionalized children or children attending remedial centers.

The Diagnosis of Retardation

Some attention has been given to the identification of organicity--*i.e.*, the discrimination of subjects with organic brain damage from subjects who do not have such damage but who do have low intelligence due to other causes. Beck and Lam (1955) found that organics tend to score lower on the Full Scale than non-organics and tend to score lower on Performance than Verbal. This was also found to be the case by Sloan and Schneider (1951). Beck and Lam found that the probability of organicity is considerable for subjects whose IQ's are below the borderline feeble-minded range (69 or less). They found no characteristic subtest patterns.

However, two studies showed no difference between V and P for organics (Newman and Loos, 1955, and Hopkins, 1964). One of these (Newman and Loos, 1955) reports higher P-scores than V-scores for familial mental defectives and for a group of undifferentiated mental defectives. However, their organic group showed no difference between P and V. Hopkins (1964) supports this finding. Hopkins concluded that the WISC had limited diagnostic significance, largely because of the large scale differences required for significance. (However, the mean scores on Arithmetic and Coding were atypically low.)

Several studies compare factor patterns of retardates and normals. Gallagher and Lucito (1961) found that patterns of bright and retarded subjects were mirror images of each other. The gifted were strongest on verbal comprehension and poorest on tests of perceptual organization. Exactly the opposite was true for the retarded subjects. Both patterns differed from the pattern for average subjects.

Baumeister and Bartlett (1962a) found three factors--general, verbal, and performance--common both to normals and retardates. However, retardates also yielded a fourth factor which included coding, picture arrangement, and arithmetic as dominant variables. This fourth factor was interpreted as supporting the theory that stimulus traces may not persist as long in retardates as in normals (*i.e.*, the short term memory of retardates is weak).

Baumeister and Bartlett (1962b) also tried to distinguish among institutionalized and non-institutionalized groups. Essentially the same factor patterns were found for both groups; however, the intercorrelations tended to be lower for the institutionalized subjects. (Both groups yielded the short-term memory factor.)

Other Characteristics of the WISC for Retardates

Carleton and Stacey (1955) compared item-data of retardates with item-characteristics reported in the WISC manual (which were based on a sample with full range of ability). Difficulty values were ranked for each scale for both groups. The rank-order correlations obtained ranged from .85 to 1.00. Biserial correlations between item-scores and total-scale-scores indicated that most items are significant discriminators.

Several studies report reliability data on retardates. Throne, Schulman, and Kaspar (1962) report three-month stability coefficients on all subtests. The V, P, and Full Scale IQ scores were found to be adequately reliable. Subtests that, in the researchers' opinion, were adequately reliable included only Comprehension, Arithmetic, Picture Completion, Block Design, and Coding. The means of each of the IQ scores did not change significantly over the experimental period.

Reger (1962), using educable mentally retarded subjects, calculated one-year and two-year stability coefficients. Reger found that average

Performance scores changed significantly, while average Verbal scores did not change significantly, even after two years. The change in Performance score could be attributed partly to the training school program, although this could not be determined from the data.

Whatley and Plant (1957) also report one-year reliability data. They found that neither V nor P changed significantly over the one-year period. These subjects were children who were enrolled in a regular public-school elementary program but had IQ's no higher than 90.

Relationships of WISC and Other Variables

Other Tests. Sandercock and Butler (1952) related the WISC to the SB and some measures of academic achievement in a group of mentally defectives. SB and WISC Verbal had a high positive correlation. SB, WISC V, and WISC Full-Scale all correlated equally well with the achievement tests.

Nale (1952) also compared WISC and SB scores. He obtained an average WISC IQ of 2.5 points higher than the SB mean IQ. This is consistent with reports reviewed in an earlier section of this paper.

Rohrs and Haworth (1962) related the WISC to the SB, L-M and the Goodenough Draw-A-Man Test. The results were as expected--SB L-M correlated more highly with V than P. However, the WISC Full-Scale IQ was significantly lower than the SB L-M IQ. Moreover, the group's average IQ as measured by SB L-M was significantly lower than their IQ as measured by the SB form L, which was administered sometime before the experimental period. This study involved both organics and non-organics. The author noted that the organics had a significantly higher mean and variance than familials on the SB L-M. This study certainly points out some need for additional research on the new SB.

One report (Sloan and Schneider, 1951) compared the WISC, SB Form L, and the Arthur Performance Test. As expected, the SB correlated highly with WISC V and the Arthur Scale correlated highly with WISC P.

Reger (1962) related the WISC to the Peabody Picture Vocabulary Test, (PPVT) and achievement on the Wide Range Achievement Test and the Metropolitan Achievement Tests. Some of the subjects were not mentally retarded, but these subjects were either emotionally disturbed or academically retarded. The IQ's ranged from 71 to 109 and this heterogeneity might invalidate the conclusions. In any case, correlations between the Peabody IQ's and WISC V, P, and Full Scale were .60, .55, and .60, respectively.

Miscellaneous Papers

Proration. Silverstein (1963) studied the proration procedure as applied to retarded subjects. He found a higher Verbal six-test IQ than five-test IQ with Digit Span omitted. The six-test Performance IQ was identical to the five-test IQ with mazes omitted, but it was lower than the mean IQ with coding omitted. Proration can evidently introduce constant errors in the WISC IQ's of mentally retarded children.

Bilingual Children. Mentally-retarded Mexican-descent bilingual children were compared to a group of unilingual children equated on WISC P, age, and sex (Altus, 1953). The unilingual group averaged 17 points higher on WISC V than the bilingual group. The subject pattern of the bilinguals appeared to be unique and was considerably dissimilar to the customary adult Wechsler pattern for the mentally retarded.

Extrapolated Atypically Low IQ's. Ogdon (1960) provides a method for linearly extrapolating Full Scale IQ's down to 28. (One obtains an extrapolated IQ of 28 for a scaled score total of one.) Ogdon warns that frequently variables that are linearly related in the middle ranges are not linearly related in the extremes. The reviewer believes that this is a very dubious procedure and probably should not be used since latent variables seldom have linear relationships with observed scores at the extremes of the observed score range.

WISC Short Forms. Carleton and Stacy (1954) studied the relationships between total IQ's and various short-forms of the WISC which were composed of certain combinations of subtests. Combinations of only two subtests correlated from .64 to .80 with total scores. Correlations of combinations of three subtests with totals ranged from .73 to .84. Correlations of combinations of four subtests yielded correlations with total scores between .82 and .88.

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THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

FINE ARTS*

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INTRODUCTION

The materials included in this package are intended to perform three different tasks.

The first part serves both as a preview of a paper to be presented to the Fine Arts discussion group of the 19th Teacher Education Conference held at the University of Georgia on January 20, 1965, and as an introduction to two reviews written by research assistants working in the Fine Arts Section of the Research and Development Center in Educational Stimulation at the University of Georgia. The first part is designed to point to the most fundamental problem the reviewers encountered during their process of abstracting research studies in aesthetic measurement.

The second part is designed to point to the striking similarity of methods and materials used in aesthetic measurement fifty years ago and today.

The third part is designed to point to representative samples of studies in aesthetic measurement, to compare them with each other, and finally, to suggest some directions that future study in this area might take. A partial list of studies reviewed by this group is included at the end of the third part.

DEFINITIONS - THE ULTIMATE BASIS OF AESTHETIC MEASUREMENT

January, 1966

Hugh W. Stumbo

If an art teacher asks an art student how much art work he has done in the past six weeks, the student may answer that he has done a lot. If the students grade is obviously at stake the student may be a little more precise and say that he has done more art work than the average student in his class. But precisely what does the art teacher mean by the expression 'art work'? And how would one measure it? To answer the first question requires some kind of definition of 'art work'. And to answer the second one requires a transposition of the definition into numbers that can be treated in some analytical manner.

By way of analogy to our example of art work and how it can be measured and analyzed, consider the relatively new technique of body building, called 'isometrics', in contrast to the more traditional technique of weight lifting. In isometric exercises the body builder exerts a push or pull against an immovable object such as a bar fastened to some stationery pillar at each end. By changing the position of the bar the body builder is able to restrict his exercise to only those muscles which he desires to build. In contrast, the traditional weight lifting techniques consisted of a variety of pushes and pulls in which a bar with weights at each end was lifted from a resting position upward and lowered again to the original position. In order to make the point of this example more clear answer the following question, "Did both body builders do work?" If your answer is yes concerning both body builders, you are probably correct according to the ordinary usage of the term 'work' but in a technical sense you are wrong. For the physical scientists, at least, you are wrong by definition. Since his definition of 'work' accounts only for those instances when a push or pull moves something with weight through a distance, the isometric exercises obviously do not involve work whereas the weight-lifting exercises do. The push or pull is called force and the weight is called resistance. The first body builder applied force to the resistance, but did not move it. The second body builder applied force and moved the resistance through a distance by lifting it upwards.

In ordinary language the art student in our first example above may meaningfully say that he has done a lot of work during the past six weeks. However the physical scientist must be more precise. He may not say that a certain machine worked a lot. But he may say that there was one foot-pound of work done. It would sound strange for an art student to answer his teacher's question concerning the amount of art work he has done by saying that he did 33,000 foot-pounds of art work. But for the physical scientist a foot-pound is just another unit of measure which allows him to analyze the physical behavior under consideration.

It should be understood that the foot-pound is an arbitrary unit of measure arrived at by multiplying the force by the distance through which it acts. One foot-pound is the work done by a force of one pound acting through a distance of one foot. If you lift a weight of ten pounds to a height of four feet, you do 10 X 4 = 40 foot-pounds of work.

Although the ordinary art teacher does not require units of measure with such precise determinants, the experimental researcher in art education does. One might go so far as to say that the validity of research in art education depends upon the adequacy of the measuring operations involved in that research. Accepting this idea as a principle appropriate to any analysis of descriptive or experimental studies conducted in art education, a reviewer of those studies is in a position to ask one of the most fundamental questions, "What has been measured?"

In order to more clearly assess the adequacy of an answer to this question it is desireable that we first establish a theoretical framework to function as a guide. It is as follows: 1) The validity of research in art education depends upon the adequacy of the measuring operations involved in that research. 2) The adequacy of the measuring operations of any research project in art education depends upon the clarity of the key concepts such as 'aesthetic value' and 'artistic value'. 3) The clarity of the key concepts in the measuring operations involved in art educational research is dependent upon a critical analysis of, and clear accounting for, major alternative aesthetic and artistic values. Armed with this theoretical framework the essential argument of this paper is as follows: Since all of the research reports reviewed by the Fine Arts Section of the Research and Development Center fail to give a clear accounting of major alternative meanings of key terms such as 'aesthetic value' and 'artistic value', it must be concluded that the key concepts, and therefore the measuring operations, and finally the research reports themselves fail to satisfy the postulates of the theoretical framework presented above.

The main part of this paper will consist of a discussion of different kinds of definitions (The information concerning the five general categories of definitions will be taken primarily from Irving M. Copi's book, Introduction to Logic, The Macmillan Company, New York, 1961, pp. 89-99.). The "descriptive definition" which will be offered as a tentaive solution to the problem under consideration will be taken from Stephen C. Pepper's book, The Basis of Criticism in the Arts. The most relevant research reports reviewed by the Fine Arts Section of the Research and Development Center and referred to in this paper may be located in the list of references at the end of the review by Charles V. Powell entitled, "A Critical Analysis of Selected Research Studies in Aesthetic Measurement", part three of this report.

SOME SIMILIARITIES OF METHODS AND MATERIALS IN DIRECT TESTS OF AESTHETIC MEASUREMENT OF THE PAST FIFTY YEARS

January, 1966

By
Laura R. Fortson

Except for the techniques of factor analysis, the methods and materials used in the attempts to measure aesthetic value in works of art, and aesthetic qualities and artistic abilities in people are much the same today as they were fifty years ago. With the similarity of methods and materials there remains also the discouraging similarity of persistent problems which, of necessity, accompany attempts to devise instruments of testing in an area so complex as aesthetics. The methods used by Irwin L. Child (1) at Yale University in 1962 and 1964 in attempts to measure aspects of aesthetic sensitivity are much like those employed in 1918 when Cattell, Glascock and Washburn (2) set out to make "a preliminary exploration of one part of a possible test of aesthetic judgement of pictures." In both the 1962 and the 1918 experiments the materials used were prints of original paintings to be ranked in order of preference both by experts and by college students. The judgments of the art experts formed the criteria for the judgment of aesthetic value. Both studies sought to determine what relationship exists between the rankings of experts and the rankings of college students regarding the aesthetic value of pictures.

In 1925 E. O. Christensen (3) devised one of the first of the various tests based on the method of pair comparisons. In Christensen's test two works of art are shown in reproduction, one of which is judged to be a better work of art than the other. The testee is to choose the better one, and to check one of the five reasons provided for his choice. Phillip P. Fehl, (4) in his article "Tests of Taste" (College Art Journal, Vol. 12, 1953) says of Christensen's test, "An obvious disadvantage of the test is presented by the elicitation of value judgments within the framework of a multiple choice test. Even if the examples were chosen with a better sense of propriety, the student's taste can only be confused by the aids offered him to make a correct choice."

These disadvantages were avoided by the Meier-Seashore Art Judgment test of 1929, which did not call for justification of choices, but was similar to Christensen's test in that it, too, was based on pair comparison of pictures. The Meier Art Test, devised in 1940 was different from its predecessor, the Meier-Seashore test, only "in that it is composed of 100 items instead of 125, and that 25 items are given double weight in scaling....The basic consideration remains the same, art judgment being regarded as the most important single indicator of artistic competence." (Norman C. Meier, "Meier Art Tests", 1940).

The Meier Art Test is simple, and again the student is shown pairs of reproductions from which to choose the better. However, in the Meier test one reproduction in each pair presents (supposedly) an original work of art, the other reproduces the same work of art slightly changed. The original work is considered to be better. Phillip Fehl again comments, "Unfortunately the pictures are often reproduced in such poor fashion that they defeat many of the test's advantages. Plate 48 in the Meier test shows the tondo relief of the Madonna with the Christ Child and Little St. John, by Michelangelo. A represents the original. In B the head of the child is turned the other way. In order to obscure the drastic change effected in B it was found necessary to show A and B in the form of rather sad drawings. The problem presented to the student is therefore quite different from the one intended. He has two bad drawings from which to choose the better. The little boy in B, in a less complicated pose than A is actually less offensively drawn -- and the fact that he looks out of the picture seems to lend interest to an otherwise dull affair."

Fehl continues, "Further disadvantages lie in the nature of many examples chosen in the test. Some illustrations are sufficiently out of date as to strike the spectator as equally peculiar." In pointing out several illustrations in the Meier test which show the influence of culture and fashion of the 1930's, Fehl comments upon a pair of illustrations in which the composition in A, (correct) is more complacent, and in B, more dramatic. He says, "In the thirties the complacency of A was appearently not so noticable as it is now. The lesson: Mediocre works of art, when compared with mediocre adaptations, do not necessarily show up to advantage."

The McAdory Art Test in 1929-30 was "devised to overcome what was recognized as cultural limitations of the Meier test."(5) Here the testee chooses the best, next best, third best and worst when presented with 72 plates each comprising four illustrations which treat a single subject in four different ways. Each plate calls for discrimination in one or more of the following art elements -- shape and line arrangement, massing of light and dark, color, use of hue, value and chroma. McAdory believes these to be the elements which are essential in the correct determination of the value of a work of art. By testing the ability to respond correctly to choices involving solely the above "elements" she hopes to make her test truly objective. (Fehl, 1953). One wonders, however, on examining the illustrations Miss McAdory uses in her test, if these pictures really elicit discrimination of the "art elements" she claims, and if these "art elements" as presented by the pictures are really main factors in aesthetic judgment. One tends to doubt this as one looks at her items of "spoon form" and "dress design". Miss McAdory seems to have fallen victim to the very cultural influence she wished to avoid. The present reporter again agrees with Fehl when he says that in viewing the plate of the four dress designs "Today's spectator can only gasp. The apparition from the twenties is charming -- but which is the better dress, the better shape and form? The "absolute" test could not stand the test of thirty years. Today, perhaps, we may guess why Miss McAdory and her experts preferred and still expect us to prefer A to C. C accentuates the pelvic region, and A something like honesty. Are these pure, absolute elements of art? Another more important aspect of testing also appears in this illustration because it is so out of date and, therefore, open to the recognition of implied stylistic convictions: D seems to have been the choice ranked first by Miss McAdory, because it represents an agreeable compromise of the extremes A and C. This tendency to settle for the lowest common denominator among the highest goods seems inherent in any system based on consensus, that is a compromise, of experts..."

The Graves Design Judgment Test 1946-48 claims, even more strongly than the McAdory test, to evaluate "absolute" principles of art. It was based almost entirely on abstract design. Graves (6) states, "Representational art was avoided in the test because of the possibility that ideas and prejudices associated with the objects illustrated might influence a subject's decisions ... Therefore, to insure an aesthetic response unaffected by factors foreign to pure design, abstract or non-objective elements were used." Here the testee is again asked to choose the better of two aesthetic stimuli in the form of abstract illustrations. And here the group of modern experts, whose judgments form the criterion of value, seem to be influenced just as truly by the fashions and whims or modern art as McAdory was by the art styles of the 20's and 30's.

Fehl, in his summary of "Tests of Taste" says, "All tests which we were able to examine were themselves tested by experts, according to the majority rule. But it was overlooked that in matters concerning art only opinions and not facts can be collected. Opinions will not become laws if one seeks out their lowest common denominator and establishes it as norm in the judging of works of art. The introduction of the majority rule opened the door to exactly that relativism which the tests, proud of their supposed objectivity, do not recognize .....

"We may safely conclude that the results of the tests, old fashioned or modern, cannot be very indicative of taste. They are, nevertheless, not without their usefulness. In vocational guidance they should, to a certain extent, accurately predict, not whether the applicant is gifted to become a good artist or connoisseur, but whether he is likely to be successful as a mediocrity, gifted to follow the beaten track of the lowest common denominator in an outstanding fashion."

It is the opinion of Fehl that, "The subjective tests, using any or all of the imaginable stimuli that invite the full exercise of one's powers in the aesthetic judgment of a given object are, in our opinion, the only suitable tests for the determination of a person's ability to develop his taste. As we have pointed out they do not involve "measurement". And, they depend on the direct communication from person to person, indispensible in the judging of one's genious for the quick and just perception of beauty and deformity in the work's of nature and art."

It is interesting to note that in tests as similar in content and methodology as the ones discussed on preceding pages that there is little, if any, agreement on what these tests actually measure. Herbert A. Carroll, (7) in 1933 asked the question "What do the Meier-Seashore and the McAdory tests Measure?" This question has not been answered. Due to the fact that the Meier and McAdory tests are considered the most popular of art judgment test and are more widely used than other tests, this unanswered question as to whether or not the tests really measure what they claim to measure is a serious one, for it casts doubts as to progress made in the whole field of testing for aesthetic judgment.

The conclusions of Carroll were that (1) neither the Meier-Seashore Art Judgment Test nor the McAdory Art Test correlate to any considerable extent with the judgment of university art instructors relative to creative ability of art majors in college; (2) training in art appears to influence an art test but slightly. "Whether this is because art tests measure an innate talent rather than a learned reaction, or because they do not measure what is ordinarily taught in art courses in not known."

Barrett, H. O. (1949), in using the McAdory, Meier, Knauber, Lewerenz and Dominion Intermediate Test of Intelligence with 9th grade art classes to determine their validity and the relation to intelligence and art ability as judged by experts, found that critical judgment as measured by the McAdory test bears a slight relationship to the same quality as measured by the Meier test, but very little to the Knauber test and very little to success in school art exercises. He found the McAdory test of little value in predicting success in school art. Critical judgment, as measured by the Meier test does play a part in determining success in art, but the prediction value is less than that of school marks. (8)

George Birkhoff's scale of "Aesthetic Measure"(1933) presents an interesting departure from the "expert judge" technique for arriving at criteria for aesthetic value, although it too, suffers from the influences of the culture and art tastes of the 30's, and from the state of psychological knowledge at that time. The artistic stimuli, in the form of sets of polygons and vase shapes, which Birkhoff presents to the testee to be ranked in order of preference have each been assigned an exact aesthetic value ascertained not by expert judges, as in other tests but by the application of a mathematical formula. Birkhoff is concerned entirely with the formal aspects of art, which he states to be fundamental to aesthetics, and as a resutl of his analysis of these "laws of art" he has devised formulas which he claims will accurately measure the value of art objects, music and poetry. (9)

Birkhoff's scale has been tested in 1929 by D. J. Wison, in 1936 by R. C. Davis, and in 1937 by J. G. Beebe-Center and C. C. Pratt. Wilson concludes that results of his study do not support the hypothesis of Birkhoff, and suggests that a more fruitful approach to the derivation of an aesthetic formula might be to weight those features which are found empirically to have the most aesthetic value. (10). Davis points out that Birkhoff attempts to derive support for his formulas by a priori psychological arguments. These are shown to be unacceptable, a major fault being their basis in stimulus-error. (Davis doubts the validity of the stimuli. He interprets the test results to show that the ploygons and vase shapes do not elicit the type nor degree of aesthetic discriminations which Birkhoff claims. This criticism holds true for his tests of music and poetry also.) Davis found that evaluations of polygons on the basis of Birkhoff's scale yield no correlation with the average rank assigned by subjects, and that his results show no support for the formula. (11)

The main conclusions of Beebe-Center and Pratt (12) in their study of Birkhoff's "Aesthetic Measure" might well be applied, in the opinion of the reviewer, too all of the tests of aesthetic judgment treated in this paper, and so they are presented here both as specific and general conclusions.

Beebe-Center and Pratt point out that (1) The specific equations representing Birkhoff's aesthetic measure for objects of art of various sorts in general agree with group preferences as well as the preferences of any individual; therefore, form this point of view, Birkhoff's formulas are valid as "first approximations" to quantitative ranking of aesthetic value. (2) To go beyond this, however, would require greater refinement of analysis, both qualitative and quantitative, because of the complexity involved in aesthetic preference. (3) Birkhoff's formulas suffer from stimulus-error (as, in the opinion of the reviewer do the tests of Meier, McAdory, Knauber, and Graves). (4) The nature of aesthetic value needs more accurate definition, in order to know whether it is to mean the average of unselected groups of observers, the average for artists, or whether it is not an average at all, but rather the judgment of a recognized authority, critic or teacher. (5) The quantitative analysis of aesthetic judgment needs further refinement. (6) Improvements in testing methodology are needed.

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A CRITICAL ANALYSIS OF SELECTED RESEARCH STUDIES IN AESTHETIC MEASUREMENT

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By
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In September 1965 three research assistants from the Research and Development Center in Educational Stimulation were assigned to the area of Fine Arts Education under the supervision of Mr. Hugh Stumbo, Assistant Professor of Art at the University of Georgia. This group took as its first assignment a review of the research literature in certain areas of art education. This paper is a report and discussion of some of the research studies reviewed in the area of measurement in art education research. Though the studies upon which it is based are limited to the visual arts, it is believed that most of the discussion is applicable to the Fine Arts in general.

Measurement studies were chosen to be first reviewed in the belief that measuring instruments are of central importance to scientific research in art education. It seemed obvious that the validity and usefulness of the research in art education depended upon the adequacy of the measurement operations involved in that research. These beliefs are derived from a philosophic consideration of the nature of scientific research.

A fundamental property of such research is that it involves the making of comparisons. According to Campbell and Stanley (1963, p. 176), "Basic to scientific evidence...is the process of comparison, of recording differences, or of contrast. Any appearance of absolute knowledge, or intrinsic knowledge about singular isolated objects, is found to be illusory upon analysis. Securing scientific evidence involves making at least one comparison." Intimately related to scientific comparison is the concept of measurement. Aside from simple same-different comparisons, the making of any comparison implies measurement on at least an ordinal level: does object A have more, less, or the same amount of quality X than does object B? If research in art education is to become a scientific discipline (as some art educators desire), then its claim to such status depends upon the adequacy and validity of the measuring instruments which it employs. These instruments are fundamental to the task of conducting scientific research in art education.

The objectivity of aesthetic measurements

The question of objectivity in aesthetics is an old one. Essentially the question concerns the extent to which aesthetic values are "stimulus-bound", or determined by the intrinsic qualities of the object itself rather than stemming from the characteristics of the individual observer or the surrounding enviroment. The question is of considerable importance in formulating a basic art education philosophy. It is also of importance to measurement, since to the extent that art values derive from physical properties of art objects, one can aspire to devise physical instruments for measuring those values. Four studies were found having particular relevance to the objectivity of measurement. Three of these were studies on the construction of scales of aesthetic value by psycho-physical techniques (Ekman and Kunnapas, 1962a, 1962b; Koh, 1965). Scales constructed by ratio estimation methods and those constructed by category or interval methods were found to have a logrithmic relationship to each other. This relationship is characteristic only of prothetic judgments (judgments along a quantitative continuum); it does not hold for metathetic judgments (judgments along a qualitative continuum). This result suggests that aesthetic judgments are governed by variables which vary quantitatively rather than qualitiatively. It seems reasonable to suppose that such variables are more likely to be objective properties of the thing judged than subjective characteristics of the viewer.

One of the most common means of determining aesthetic quality, that of using the average judgment of a number of art experts, rests upon the hypothesis of an objectively existing aesthetic order which can be determined by averaging the judgments of a sufficiently large number of observers. Eysenck (1939) reports a study supporting this hypothesis. In his report, he refers to studies in which a number of judges are given a series of weights and asked to arrange them into rank order according to weight. The differences in weight are so slight that the correct order is not obvious, and each judge usually makes a number of mistakes. However, for a sufficient number of judges the average rank order obtained will approximate the true rank order, and this approximation increases as the number of judges is increased. Eysenck, using the average judgment of 700 subjects as the criterion of true aesthetic order, studied the extent to which the average aesthetic judgments of groups of judges approximate the true order as the number of judges increases. He found that as the number of judges increases the approximation improves (when averaged over all possible combinations of the given number of judges drawn from a larger population of judges), and that the mathematical formula describing the relationship between the number of judges and the accuracy of the approximation has the same form as the one describing the same relationship in the weight studies. Thus there is here some evidence that there is a definite order which will tend to emerge when a sufficient number of judges are asked to evaluate objects upon their aesthetic merit, and that this order is independent of the individual judges used. By analogy with the weight experiments, one is tempted to think of this order as the "true" or objective order of aesthetic merit.

Measurement of aesthetic quality

One of the major goals of courses in art may be taken to be that of developing the student's ability to produce works of high aesthetic merit. A corresponding major task in art education research, therefore, is the systematic investigation of factors likely to affect artistic quality. Such research requires a standard, uniform, objective measure of quality if different research studies in this area are to be meaningfully compared. However, such a measure does not presently exist. Thomas (1964, p. 246) states that, "At the present time, the reader of research reports is never sure that the teaching methods lauded by one investigator and those praised by another have led to art products that were appraised by the same scale of aesthetic value." The same may be said of studies investigating the relationship of any specific variable to the quality of art produced by the student. Unless quality is measured in the same way in each study, the results of comparing different studies will be ambiguous.

The use of expert judgment. The most common practice today in assessing quality is to use the average judgments of a number of persons considered to be competent in art. These may be artists, art educators, art historians, graduate students in art, or simply, as in one study, "persons who felt competent to make the judgments required" (Child, 1962). Thomas (1964) cites fourteen recent studies using this procedure. Most studies reviewed in the area of measurement also used this method.

The present use of experts as, in effect, measuring instruments for quality appears to be quite unsatisfactory for several reasons. To justify the use of average judgment of experts as a criterion of quality, one has to assume that some aesthetic order exists which is independent of the individual judges and which will be revealed by the average judgment, as suggested in the Eysenck (1939) study, and that this order, when found, will consistently provide a satisfactory measure of quality. To make valid use of this tactic, however, one must first employ a sufficient number of judges. Eysenck's study suggests that at least 30-50 should be used; this number falls far short of the usual practice of using less than ten judges, or even less that five. Second, the judges used should be a random sample from a defined population of judges. Otherwise the average judgement obtained will depart from the theoretical order because of sampling error and the order obtained will not be independent of the individual judges. This latter requirement was not met in any study yet reviewed. Most studies give the impression of using any judge who happens to be at hand, (see quote from Child (1962), given above). Finally, even if a random sample of a sufficient number of judges is employed, the result, because it is an average, may not be suitable to the purposes of any given individual teacher. The averaged judgment, for example, may be influenced by factors which an individual teacher may feel are irrelevant to aesthetics.

Besides the assumption of an underlying aesthetic order, the average judgment method involves the further assumption that errors of judgment which cause individual judges to deviate from the true order are normally distributed about a zero mean. If the mean error is substantially different from zero, the average judgment clearly could not reveal a true underlying order even if such existed. In the weight experiments referred to by Eysenck (1939), the assumption of a zero mean seems to hold and by analogy one might expect it to also hold for aesthetic judgments. At present, however, not enough is known about the factors influencing aesthetic judgments to determine what their distribution is in the population of judges. While the assumption of a normal distribution is reasonable, it still remains to be shown whether it is indeed the case.

That there are a number of factors influencing judgments of aesthetic value is beyond question. Many, perhaps most, of these might be classed as factors clearly relevant to aesthetics, but a number of other factors have been indicated which are clearly non-aesthetic. Thus, Newcomb (1962), for example, found that male elementary art teachers tended to rate the drawings of girls higher than those of boys when they knew the sex of the artist. Birney and Houston (1961) found evidence that judgments of art are influenced by social pressures. Subjects were asked to express a judgment in the presence of two other judges who had just expressed a judgment intentionally different from an earlier judgment of the subject. All of 60 subjects yielded considerably to the pressure of the majority opinion. While Birney and Houston used college freshmen and not art experts as their subjects, psychological research has shown that the tendency to yield to majority opinion is a widespread human trait, and there is no good reason to suppose that it does not apply to art experts also (though differences in susceptibility to this influence do exist, of course). Whether the subject's true judgment changes, or whether it is only his expressed judgment, is not known. These studies clearly show, however, that in securing expert judgments the experimenter should insure that each judge acts in the absence of knowledge about the judgments of any other judge.

In addition to such factors, the well-known "halo" effect is encountered when judges are asked to rate individuals or the works of individuals known to them. The halo effect is the tendency to rate well-liked persons favorably in all respects, and to rate disliked persons low. Ryan (1958), in a study of trait ratings of students by teachers, stated, "Findings in this investigation suggest that the goal of separate and valid trait ratings may be unrealistic. Instead of pursuing this goal, it might be well to accept the fact that teachers rate on the basis of general impression." Holland (1959), studying a number of personality and other factors which influence teacher ratings, found that the personal characteristics likely to lead to a high rating on any of 12 traits, including "originality", do not seem to have any consistent relationship to the traits found in other studies to characterize creative people. He states, "Although high teacher ratings have some correlates which are similar to a number of the characteristics associated with creativity, such as persistence, high academic aptitudes, and perhaps dominance, most of the correlates are more indicative of potential for leadership or academic achievement rather than creativity". While these results are directly concerned only with factors affecting ratings of known individuals, it seems reasonable to generalize them to the judgments of art works of persons known to the judge. In particular, it calls into question the judgments made by teachers of the art work of pupils in their classes. It seems likely that teacher ratings of such work (as well as grades assigned) may be based not only on artistic accomplishment but on a variety of non-aesthetic factors as well, not least of which is the teacher's overall impression of the child. Accordingly, the use of grades or of teacher ratings of quality in art education research should be approached with caution.

Birkhoff's "aesthetic measure". Birkhoff (1933) seems to have been the only person to have attempted a mathematical definition of aesthetic value. He devised the formula:

$$M = \frac{O}{C},$$

M = aesthetic value
O = order
C = complexity

which defined aesthetic value as the ratio of order to complexity. The latter terms were given mathematical definitions for each of several classes of aesthetic objects, such as polygons, vases, poetry, and melodies. Birkhoff calculated the value of a number of objects according to his formula and published his results. Three studies were found which attempted to test his finding (Davis, 1936; Beebe-Center and Pratt, 1937; Wilson, 1939). All of these used the procedure of comparing the average preferences of several observers with the rank order of aesthetic value as determined by Birkhoff's formula. The results were interpeted as not supporting his formula, as only low correlations were obtained between group preferences and the computed values. However, Birkhoff's basic thesis cannot be said to be disproved for several reasons: 1) the formula explicitly deals only with formal characteristics of aesthetic objects. To the extent that associations or other non-formal factors influence the preference of the observer, the relation between aesthetic value, as determined by formal properties only, and the preferences of observers may be expected to decrease. Studies of aesthetic preferences have indicated that such associative factors strongly influence preferences. 2) It may be questioned whether the group preferences of judges, and in particular of judges untrained in art (as was the case in the experiments cited), is a proper measure for comparison with the predicted values. In addition, all of these studies failed to meet at least one of the two minimum requirements of the method of average judgment, i.e., a sufficiently large random sample of judges. The results show only that no agreement was found between these two ways of measuring aesthetic value. 3) In defining complexity for geometrical forms, Birkhoff used as his measure of complexity the number of movements made by the eye in following the outline of the figure. Thus, for a four sided figure he assumed the eye made four movements as it traced the outline of the figure, and gave it a complexity value of four. In this respect Birkhoff was in error, for later psychological studies have shown that eye movements are much more complex than Birkhoff supposed. Should his aesthetic values be re-calculated using a less naive measure for complexity, more agreement might well be found between his predictions and other measures of aesthetic quality. It seems justifiable to conclude that Birkhoff's contribution has not been adequately tested. The advantages inherent in a valid mathematical approach to questions of aesthetic value are such that a more thorough examination and testing of Birkhoff's theory would seem to be in order.

Measurement of sensitivity to aesthetic values ("appreciation").

In addition to the capacity to produce works having aesthetic merit, a second major goal of art education may be taken to be that of instilling and developing in the student those asthetic values which are considered desirable for him to have. This may be thought of as a particular example of the broader task of teaching values in general, in which the problem is not so much the teaching of facts as it is that of causing the individual to accept a set of values as his own. Accordingly, the problem of measuring or testing for sensitivity to aesthetic values is not one of ascertaining what the student knows as much as it is one of determining how closely the values held by him approximate those which it is desired that he should hold.

Art Tests. Measuring instruments designed for the purpose of assessing the results of instruction in values will, of course, vary with the particular set of values being taught. Unless a common system of art values exists, there is thus no possibility of developing a single test of sensitivity or appreciation which would have universal applicability. It is obvious to persons in the arts that no such common value system presently exists. In developing tests of appreciation it is thus of first importance to explicitly specify the value system for which the test is claimed to have validity. Only by restricting the test to its proper sphere can it be expected to serve its intended purpose, and only by considering the test in relation to its own frame of reference can it be properly evaluated.

Unfortunately, the creators of presently existing tests seem not to have realized the limitation of their instruments to their own system of values in art. Rather, they seem in each case to have attempted to construct a "true" test of aesthetic appreciation, one having universal validity and thus one which necessarily presupposes the existence of a universally held system of art values. The result has been a proliferation of tests, no two of which bear any substantial relationship to each other. It is a common research finding that the various "art tests" on the market correlate very low among themselves. For example, correlations of from .12 to .51 are found between various art tests in the following studies: Barrett, 1949; Bolton, 1955; Carrol and Eurich, 1932; Child, 1964; Crannell, 1953; Dewar, 1938. The highest correlation found, .51, indicates that at best scores on the various tests have only about 25% of their variance in common. Similar results were found for tests of "imagination" and "creativity" in studies by McGeoch (1924) and Brittain and Beittel (1961).

Probably the best known of existing art tests are the Meier Art Judgment Test (Meier, 1928) and the Graves Design Judgment Test (Graves, 1948). The Meier Test uses original art works, each of which has been deliberately altered in such a way as to render it "inferior" to the original work. This altered version is paired with the original work and the subject's problem is to state which of the two versions is aesthetically superior. The Graves Test employs a similar procedure using abstract designs which were constructed expressly for the test. In both tests the choice of the "correct" member of each pair is claimed to be based on some "fundamental Principle" of aesthetics, but it may be noted that the correct answer is determined by one or more experts, which automatically limits the applicability of the test to those experts' value system. This is a characteristic which the Meier and Graves tests share with all other present tests of appreciation, regardless of the methodology employed in constructing the test.

For example, Karwoski and Christensen (1926) required the testee not only to make a correct choice but also to decide for which of five reasons the correct choice was superior to its alternatives. The "correct" reason, of course, was determined by the tests' inventors. Kieselbach (1956) used a somewhat different methodology, requiring his subjects to adjust each of a series of pairs of disks containing abstract designs until the pair formed the most pleasing arrangement to him. Each possible combination of each pair was assigned a numerical score according to its relative ability to discriminate art students from non-art students. Thus Kieselbach's instrument is not theoretically dissimilar to those of others, since it rests ultimately upon the judgments of experts and is thus tied to the value system of those experts.

Researchers setting out to test these measuring instruments seem to have made the same mistake as the test originators and have thus attempted to evaluate each instrument for its validity as the "true" test of aesthetic appreciation. Under such circumstances conflicting results may be expected, the "validity" found in each case being a function of the similarity between the value systems of the test constructor and the researcher. Thus, for example, in one study (Lepore, 1962) the Graves Design Judgment Test proved capable of predicting success in art classes; in another study (Karang and Sandstrom, 1959) it did not, as neither did the Meier test. The comparison criterion in both cases was academic success in art schools, as determined by grades or teacher ratings. Since grades or ratings depend, at least in part, upon the individual teacher's art values, the discrepant results may partially be attributed to differences in the degree of similarity in the art value systems of Professor Graves and the individual teachers concerned.

Since art class grades or teacher ratings may also be a function of a number of non-aesthetic factors, as brought out previously, they are apparently not a satisfactory criterion for use in validation of art tests. Every other criterion that has been used, however, can be similarly criticized. Barrett (1949), for example, compared test scores with an art ability criterion based on the judgments of four (only four) experts of childrens' art work. Dewar (1938) and Crannell (1953) used similar procedures. Carroll (1932) used teacher ratings of students' creative ability. All of these procedures can be criticized on grounds previously discussed. Since all of them are subject to the influence of non-aesthetic factors, the influence of such factors has probably been confounded with the influence of differing value systems, so that we cannot even gain from this research any estimate in which we can have confidence of the similarity between value systems of tester and researcher. In short, the body of research so far done using presently existing art tests appears to be virtually useless, except as an indication of some things we are doing wrong.

The above criticism of the research carried out to test the validity of present tests of art appreciation does not necessarily extend to the tests themselves. Precisely because the research itself has been largely invalid, we have little knowledge about the validity of these tests. Within their own frame of reference it is quite possible that they are valid instruments. In this area of research the logical next steps would seem to be, first, to determine the structure of the value system underlying each present test and second, on this basis to come to some decision regarding the probable general usefulness of each test. This decision would essentially be an estimate of how closely each test's value system corresponds to the value systems of art teachers in general or to selected sub-groups of teachers. If it results that present tests, or modifications of them, would justify the expenditure, a program of research could be undertaken to determine the validity and limitations of each test within its frame of reference. If present tests should not appear to justify the effort involved, then it would remain for research to be carried out to develop new instruments more suitable to the value systems of present-day art.

Agreement with group preferences. Though the main research interest in the field of testing aesthetic appreciation or sensitivity seems to have been in the development of various objective tests, a quite different but equally objective measure has been proposed by some writers (Eysenck, 1957). This measure is derived from the theoretical position underlying the use of average judgment in the measurement of aesthetic quality. If the true order of aesthetic merit is revealed by the average judgment, then the degree of agreement of an individual judge with the average judgment might be taken as a measure of his sensitivity to aesthetic values. No studies have yet been found which employed this definition of aesthetic sensitivity. Child (1962; 1964) found that when the reference group is composed of persons untrained in art the agreement of individuals with the group preference showed little relation to the same individuals' agreement with the group judgments of 13 experts. This may simply be due, however, to the fact that the average judgments of the experts and non-experts were unrelated. Child did not go into the question of whether this definition of sensitivity is of value when limited to the frame of reference of any given group. It may be that the reference group should be limited to expert judges only. Agreement with the group judgment of experts thus might prove to be a useful definition of sensitivity while agreement with that of untrained persons may not be.

Measurement of Aesthetic Meaning

"Measurement of aesthetic meaning" is here understood to be the measurement of the connotative impressions or meanings gained by the perceiver of a work of art. Thus, one may ask whether a painting is perceived as "good" or "bad", as being "hard" or "soft", "strong" or "weak", "sharp" or "dull", or as having any one of many other such qualities which may be perceived in the painting. Knowledge of the experimental correlates of such connotations which are aroused in a viewing situation may reasonably be expected to provide important information toward understanding the relationship between the work of art and the perceiver. Such work might well be of value not only in studies of aesthetic appreciation but in studies of the nature of aesthetic values as well.

A satisfactory instrument to measure these connotative meanings did not exist until the semantic differential technique was developed in the last decade (Osgood, Suci, and Tannenbaum, 1957). This technique, originally developed for the study of verbal meaning, appears to be applicable to the measurement of meaning in general. Basically, it consists of constructing a series of scales, the endpoints of which are defined by pairs of bi-polar adjectives, such as "good-bad", "masculine-feminine", "intelligent-stupid", etc. The scale between the members of each pair is usually divided into seven steps, as shown:

1. good ____: ____: ____: ____: ____: ____: ____: bad
2. hard ____: ____: ____: ____: ____: ____: ____: soft
3. weak ____: ____: ____: ____: ____: ____: ____: strong

etc.

The number of scales used and the particular adjectives chosen may be varied to suit the purpose of the individual experiment. In administration of the technique, a set of such scales is given to the subject and the object or concept, the meaning of which is to be measured, is presented to him. The subject then places a check-mark on each scale at the position which seems to him most appropriate to the stimulus object. This procedure is repeated for each stimulus.

When a large number of scales are used many of them are usually interrelated and a factor analysis may be applied to the ratings. In studies with verbal concepts, three major factors have consistently emerged. These have been labeled the "general evaluative", "activity", and "potency" factors. (Osgood, et. al., 1957). These factors are best represented by the "good-bad", "active-passive", and "strong-weak" scales, respectively. The consistency with which this factor pattern has appeared in a wide range of studies over many concepts indicates that this finding has general validity and suggests that connotative verbal meaning varies primarily along these three major dimensions. It has been shown (Osgood, et. al., op. cit.) that a "semantic space" may be constructed using these dimensions, that individual concepts may be located in this space by plotting their factor scores along the three major axes, and that distances between two concepts in this space can be quantitatively compared.

It may be asked whether the meanings of aesthetic objects, similarly measured, would also vary along the same dimensions. Tucker (1955) found this to be true for representational (non-abstract) paintings. It was not the case for abstract paintings. For artists, the meaning of abstract works varied chiefly along one major evaluative dimension. For non-artists, two dimensions of meaning were noted. These did not lend themselves to verbal description, but, whatever they were, they were different from the ones already described. (For representational paintings, the dimensions of meaning were the same for artists and non-artists, thought the relative importance of each was different for the two groups.)

In a related study Tucker (1955) also inquired whether artists can intentionally convey specified meanings to unsophisticated viewers. He asked a group of art students to produce paintings expressive of one of six connotations: activity, passivity, chaos, orderliness, strength, and weakness. The paintings were shown to a group of non-art students who were asked to attribute the correct descriptive adjective to each one.

They were able to do so with much better than chance success, indicating that the artist can impart specified connotations to his viewers.

Springbett (1960) conducted a study to ascertian whether the semantic differential can profitably be used in the study of connotative meanings in non-objective art. On the basis of agreement of some of his results with certain "common-sense" observations and deductions, he concluded that it was indeed a promising instrument.

Two studies were found which employed the semantic differential to study the connotative meanings of color (Wright and Gardner, 1960; Wright and Rainwater, 1962). In the latter study, color connotations were found to be related to the properties of hue, brightness, and saturation, suggesting a relationship between connotation and perception. In the earlier study, the effect of color upon the connotative meanings of three pictures was investigated. Complex effects involving both color and surrounding context were noted.

The studies cited serve primarily to indicate the potential usefulness of the semantic differential in basic research in the arts. It has been shown that dimensions of meaning can be identified and described and that different classes of aesthetic objects and different classes of viewers can be compared with respect to the number and kind of dimensions along which connotative meanings vary. The correlates of specific connotations, the relation of connotation to perception and to personality, and the relationships of perceived meaning in art to achievement in art are among the topics which remain to be explored. The number of basic research studies which can be undertaken with this instrument appear at present to be limited chiefly by the imagination of the researcher. Knowledge gained from them promises to be very probably useful, perhaps fundamental, and at least interesting.

In addition to its use in basic research, the semantic differential appears to have applied uses as well. One potential application is in the area of measurement of aesthetic quality by expert judgment. Thomas (1964), in bringing out that judges may have differing concepts of aesthetic quality, says that "a basic need in the field of research in art education is for a scheme to identify and to compare the nature of different judges' concepts of aesthetic quality. One way to fulfill this need would be to require the judges in each investigation to take a standard set of tests of art preference so that profiles of judges' scores from one study could be compared with those from another study." It is suggested here that the semantic differential might serve as a method of comparing different judges. It could not, of course, compare directly their concepts of aesthetic quality but rather, by using a standard set of art stimuli, it could compare them with respect to the meanings which they perceive in aesthetic objects. This may well prove to be a more fundamental comparison than would scores on an art preference test. It could establish the similarity of lack thereof among various judges in the dimensions of meaning which they perceive and could compare individual judges with respect to their location within the space generated by the dimensions they have in common. Thus, individual judges could be equated for perceived similarity of meaning. How closely the judgments of aesthetic quality of such a group of equated judges would agree is a question yet to be established by research. It would probably depend largely upon the general role of meaning in art, about which little is presently known. One may speculate, however, that perceived meaning is closely bound up with aesthetic judgment, if for no other reason than that all judgment, aesthetic or otherwise, is ultimately dependent upon a prior act of perception.

Another potential application of the semantic differential arises from the fact that it may not only be used to compare two individuals at the same time but also to compare the same individual with himself at a later point in time. Changes occurring in the perceived meaning of aesthetic stimuli can be related by adequate experimental techniques to the causes which produced them. Thus, one use of the semantic differential might be in the assessment of programs in art education. By administering the instrument (using a standard set of stimuli) at various times, the effect of the instructional program upon perception of aesthetic meaning can be experimentally determined. The program may then be adjusted to produce perceptions which correlate highly with the achievement of the goals of the program. In this manner the semantic differential might be developed into a sensitive and convenient instrument for the evaluation of a program in art education at any stage of the educational process.

A related use of the semantic differential might be for the purpose of studying the effect of art instruction upon the developing personality of the child. In view of the many studies which have shown inter-relationships between personality and art, art educators might well concern themselves with the effect of their instructional programs upon the child's emerging personality. Considering the close inter-relationship of personality and perception which has been established by many psychological studies, it seems likely that any changes in personality produced by art instruction would be reflected in changes in aesthetic perception as measured by the semantic differential. Perhaps in research along these lines the semantic differential could be used to help clear up some of the present confusion over the interrelationships of perception, personality, and art. For example, it might well be that personality is related to art by virtue of its influence upon perception.

In summary, it seems that it is justifiable to conclude that the semantic differential instrument has rich potentialities for research in art and art education, potentialities which have hardly yet been tapped. It is hoped that the above discussion will have indicated some of the directions in which research with this instrument may be profitably undertaken.

Conclusion

In this report a number of suggestions for future research have either been expressed or implied in general terms. These suggestions are intended to be preliminary and somewhat in the nature of what might be called "exploratory thinking." Additional suggestions and more detailed proposals for further research in the development and use of measuring instruments in research in art education are contained in a separate report to be submitted to the Research and Development Center in Educational Stimulation. These proposals will emphasize the development of new instruments and techniques, and the adaptation of those presently existing for use with children.

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THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

FOREIGN LANGUAGE*

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INTRODUCTION

Teaching a foreign language to children is not a new trend. Similarly, the problems or controversies which arise from these programs are not new. German was taught in many schools during the last century and French has been taught to selected students in elementary grades in Cleveland since 1921. The Commissioner of Education, Dr. McGrath, gave full support to elementary foreign language programs in 1953. (2:490) The controversy became more heated and the differences of opinion were then aired on a national scale. Nevertheless, within that same year of Dr. McGrath's famous January speech, the number of elementary foreign language programs has nearly doubled.

It is the purpose of this paper to focus on the research dealing with the optimum time for beginning a foreign language. Whenever available, sociological, physiological, psychological, and curricular information has been evaluated. The major portion of the studies have dealt with the problem of judging the optimum chronological age for beginning a foreign language. Only a few are concerned with the important factors of psychological and physiological readiness. The emphasis given to chronological age ignores the significant educational findings on individual differences. Readiness tests now in the formulative stage of development, offer an even less satisfactory solution.

The research on the optimum time for beginning a foreign language has significance only as it applies to the schools' objectives. In the last analysis this controversy remains open to discussion. The nature of the democratic American educational system in a rapidly changing society prohibits one from formulating one universal solution. Whether a school system wishes to stress verbal proficiency, translation skills or world understanding will determine when foreign language should be introduced and how long it should be studied.

EFFECTS OF EARLY INSTRUCTION

The belief that children learn a second language better the younger they are to some extent rests on the observation of Americans traveling from place to place where one or more languages are spoken. The children of these Americans learn to speak and understand these languages without apparent effort. (2:491) Classroom observation and the printed accounts of researchers such as Francois Gouin, W. F. Leopold, and J. Ronjat give the same impression. (2:491)

Max S. Kirch of the University of Delaware reports that the ability to reproduce foreign sounds not present in English seemed to be "in inverse proportion to their age." (40:399) Conversely Anne S. Hoppock writes that "the 'best' age to begin may be later than we think. The experience of the armed service gives strong support to the idea that young adults with strong motivation learn languages much more efficiently than any other age group." (30:270) Anne Hoppock does write, however, that "probably the truth is that dependable research is sufficient to indicate conslusively the 'best'age to introduce a second language."

The need to clarify the objective of the schools becomes imperative at this point. If facility in foreign pronunciation is the school's aim then few would dispute the truth that childhood is the best time to learn a foreign language. Young children have not developed the many inhibitions of older children or adults, nor the "set" speech habits of the mother tongue which blocks their ability to mimic the foreign sounds. (38:518) But at what time during childhood does the plasticity of the speech mechanisms begin to harden and the child lose his "parroting" abilities? Penfield in his latest work, Speech and Brain-Mechanisms limits the child's ability in this area of foreign language to the years before ten years of age.

> There is an age when the child has a remarkable capacity to utilize these areas of the learning of language (there are four separate areas of the human cerebral cortex, according to Penfield, devoted to vocalization), a time when several languages can be learned simultaneously as easily as one language. Later with the appearance of capacity for reason and abstract thinking, this early ability is lost.
> ...The time to begin ..., in accordance with the demands of brain physiology, is between the ages of four and ten. (46:204)

Harold B. Dunkel and Roger A. Pillet in working with third and fourth grade French programs conclude after discovering that "The third-graders show no dramatic superiority in fluency, retention, or accuracy of pronunciation," while at the same time "instruction is possible and effective at the third-grade level," that "the chief merit of starting instruction in Grade III rather than in Grade IV is to make possible an additional year of contact with the language." (13:24)

In the most recent opinion poll located, 53% of the school administrators responding to the questionnaire voted yes to the question of should a second language be taught within elementary school years; 44% voted no, and 3% had no opinion. Grade III was chosen by over 39% as the most suitable grade for beginning foreign language instruction. Nearly 30% favored instruction beginning in the fourth grade. One respondent to the opinion poll wrote:

> Having taught foreign language for many years, I have come to the conclusion that the earlier the child is familiar with foreign words, the greater retention will be in later years. (17:49)

If starting a foreign language early increases retnetion or at least allows more learning to take place over a longer period of time, then it would logically follow that a language should be started at a very early age. On this point Dunkel and Pillet write:

> ...in view of the fact that a greater language aptitude, real or assumed, is likely to be proportionately negated by the aforementioned limitations accompanying lack of maturity, we suspect that instruction below the third-grade level must result in slighter returns from the hours invested. (13:24)

However, Max Kirch concludes after working with first grade German classes that "I have never had a more gratifying experience at a higher level than in the first grade." (41:145) Kirch's classes were conducted for twenty to thirty minutes, twice a week for three months. Much time was given age level interests and only German was spoken during the class sessions. Max Kirch was impressed by not only the children's "ease of imitation," but also "their ability to use their imagination." (41:144)

Theodore Andersson calls for more research on the nature of the human brain which enables him to be particularly more receptive to the acquisition of language skills. He searches for a fuller understanding of the psychology of language learning. He summarizes:

> The basic situation, however, seems fairly clear. There are apparently two essentially different kinds of learning, the so-called imitative learning of skills such as are involved in the learning of a second language--and indeed of a first. Then there is the analytical kind of learning which is needed for dealing effectively with abstract materials.
> ... Since language learning involves acquiring skills as well as knowledge, the imitative type of learning is just as important as, and indeed more basic than, the analytical type and should precede the latter.
> ... Adolescents, having a more highly trained mind, can learn more quickly about a language ... but they will despair of ever learning to understand foreign speech as well as children or pronouncing it as accurately and as naturally as children.

A British psychologist while stressing children's multilingual ability warns "We should of course remember that very young children are apt to forget other languages almost as quickly as they learn them unless they have continuous practice up to the age of ten or eleven." (1:301-302) C. E. Johnson's program seems to place greater emphasis on this last point of a continuous foreign language program than on the optimum age for beginning. (37) A. H. Beattle supports this also. (4:3-9)

Apart from the importance of continuous practice, however, Langer characterizes the favorable language-learning age by saying that "there is an optimum period of learning and this is a stage of mental development in which several impulses and interests happen to coincide: the lalling instinct, the imitative impulse, a natural interest in distinctive sounds, and a great sensitivity to expressiveness of any sort... If language is not developed during this period, he writes "the individual is handicapped..." (1:302) Tentatively the age of ten was chosen as the dividing line between conditioned learning (imitative) and conceptual learning (analytical). Before this age speech habits in the first language are not so fixed as to hinder learning of new speech habits.

In accordance with these neuro-physiological studies, the Modern Language Association concluded at its May, 1956 meeting that four should be the earliest age to begin a second language "since the first language is normally set by the age of four or five." (1:303)

Dr. Ilg, a conferee to this convention, favored age eight: at this age the child is group-minded, expansive and receptive. According to Dr. Ilg when expansion and imitation are at their height, the child learns a second language with a rush. (1:303) Dr. Ilg and other members of the conference also spoke in terms of childhood plasticity and "specialized capacity."

> The specialized capacity included the ability to mimic accurately the stream of speech (sounds, rhythm, intonation

> stress, etc.) and to learn and manipulate language patterns easily. Support for the conviction that the brain has greater plasticity for speech learning during the first decade of life comes from the fact that, in cases of gross destruction of the cerebral speech areas, return of normal speech occurs much more rapidly and more completely than at a later age. (1:304)

H. H. Stern disagrees with this explanation of mimicry. He dismisses the "imitation" theory of learning languages as mere evidence rather than explanation. He describes language learning as:

> ...an active, dynamic process, involving trial and error, within the context of socialization, acculturation and growth of understanding; it is by no means as blind as it is often made out to be. (63:98)

Mr. Stern feels that "the fundamental psychological questions which have bearing on the first decade of life are still unanswered." (63:98)

The discussion on mimicry reflects one psychological point of view. It stems from what is often referred to as behavioral psychology, classical conditioning, or S-R learning. Charles E. Osgood has made formal use of this theory and its terms in foreign language learning:

> For Osgood, the meaning of a sign or symbol is the mental counterpart, in attenuated form, of the actual emotional and behavioral responses that have habitually been made to the referent for which the symbol stands. (43:52)

Two other psychologists whose theories form the basis for further foreign language procedures are George A. Ferguson and D. O. Hebb. Their theories have been cited as evidence for shifting the learning of a foreign language to an early age. Ferguson's statement that "an individual will learn more readily those activities which are facilitated by prior acquisition and will learn less readily those activities which are not facilitated or are perhaps inhibited by prior learning," (43:61) emphasizes transfer and the importance of development along well planned sequences. However, these explanations of how "distinct assemblies of cells" function can only explain bilingual control over inter-lingual interference and not the practical problem of age or time of learning sequences.

Dorothy McCarthy summarizes the view of the "developmentalists" like Taine who deemphasize S-R but who claim that

> ...new sounds are not learned by imitation of the speech of others, but rather that they emerge... as a result of maturation...(1:300)

Attempts have been made to assess which abilities show themselves at what age level. For those who believe as J. B. Carroll does that language aptitude is a relatively stable personal characteristic, The Modern Language Aptitude Test battery which is reviewed in Lambert's article (43:60), may be a guide to selecting students for foreign language classes.

The problem concerning the nature of how children learn a language is not far removed from the controversial issue of I.Q. and the stirring "nature-nurture" argument which is beyond the scope of this paper.

The findings on the opinion poll (17:49) favor teaching language to the talented student or children with an I?Q? of 120 and up. Pillet and Dunkel found a higher correlation between the scores on the Seashore music ability test and language achievement (.37) than between the scores on I.Q. Tests and language achievement (28). (13) Mary Fisher concludes her research with the statement that "all the indices discussed are more highly correlated with chronological age than intelligence." (18:71) Bovee and Froehlich also believe that there is a low correlation between I.Q. and aptitude in French. (7:333-336) Elizabeth Etnire acknowledges a relationship between the two but dismisses it. C. E. Johnson and associates conclude "It was found that the pupils with higher I.Q.'s consistently tended to obtain higher scores on the Spanish Achievement Tests than did those of lower I.Q.'s" (34:151) Conversely, Walter Kaulfers writes "there is no scientific evidence to prove that any foreign tongue is so inherently difficult as to nessitate more intelligence than the average pupil possesses." (39:298-299) George Taylor's work in Leeds causes him to believe that oral learning a second language is possible for all ranges of ability." (66:151-161) Taylor holds that the cuase of language problems is the unsuitably trained teacher rather than any inherent limitation within the child. John Carroll criticizes the practice of language class selection on the basis of intelligence test scores and English reading skills. New methodologies are gradually wearing down the barriers of I.Q., and language programs are becoming available to more children. (20:381) Attention is now being given to other factors (57:313) (5:359-363) (65). Among the most important of these factors are verbal intelligence and motivation (52) (53)(1:487) as well as English silent reading ability (60:72-76) and home background (24:361-367).

It seems more constructive to consider the ideas of Irene Calvert (8:111-113) and C. Rivera (64:515) who advocate foreign language programs for the low, general attainers in school rather than to concentrate on further ways of limiting their activities and opportunities in the school program.

There is an important consideration contrary to the above statements: if the child's language development is average or below average, it may be more profitable to remain with the standard curriculum lest his "linguistic savings" place him at a disadvantage later in schools which accept achievement only in the standard areas without giving interest or encouragement to other areas. However, C. E. Johnson's research indicates that foreign language does not detract from gains in other areas of the curriculum. (37)

THE RELATIONSHIP OF THE FOREIGN LANGUAGE INSTRUCTION TO THE REST OF THE ELEMENTARY CURRICULUM

Max Kirch reports that

> Although some elementary school principals and administrators are willing to have foreign language as an independent subject like art or music, most feel that the elementary school program should be a well-integrated whole, with no special unrelated subjects. (40:399)

Kirch recommends foreign language be related to social studies or social living. He cites the successes of programs which utilize the resources of speakers of the foreign language from the community. Max Kirch reports the results of a sixth grade experiment in which

> ...the foreign language instruction motivated not only the social studies program, but the whole program of study and had tremendously broadened the children's field of interest. (40:400)

Anne S. Hoppock questions the feasibility of the aims of these integrated programs.

> ...that children who are given organized instruction will thereby learn to admire and respect the people of the world who speak that language
>
> ...that world peace will be furthered...(30:269)

Adeleline Strouse feels that one reason for beginning foreign language in the fourth, fifth or third grade is because it lends itself so easily to integration with social studies units. (64:515) Despite the support given foreign language specialists, one reason for giving the regular classroom teacher this responsibility is to ensure success in the challenge of integrating foreign language into the classroom. (64:515) Theodore Andersson devotes much attention to this point:

> At the elementary level teachers are more likely to be aware of the interests and maturity level of their pupils. The teacher is more likely to take into account the need to anchor teaching in the necessity of changing direction frequently, the desirability of translating into action and dramatizing what has been learned, the need to appeal to the children's imagination...
>
> It is the elementary-school teachers, too, who most frequently understand the intricability of language and culture...
>
> ...the...teacher is more likely to correlate his teaching with ... social studies, with English, with music, with art, with physical education. (2:494-495)

Daniel P. Girard and Margit McRea, two well-known educators in foreign language also support the FLES program and its correlation with other studies. (21:270)(50:510)

BILINGUALISM

Does bilingualism in young children tend to retard their learning of the mother tongue? Are some children with "language disabilities" further hampered academically and emotionally by instruction in a second language? Below are some of the research findings on this topic:

> Castillejo concludes: "The accumulation of several languages neither disturbs nor overloads the mind of the child, because to him they are multiple." (1:304)
>
> The Central Advisory Council for Education--"It appears wisest at the present juncture to accept that body of opinion that bilingualism in itself is neither an advantage nor a disadvantage to the mental development of a normal child." (1:305)
>
> Nelson Brooks--"Even if it were proved (as it has not been) that... children are below standard in English vocabulary because of bilingualism, the knowing of a few less lexical items in the mother tongue at a given age may be a modest price to pay when, in exchange, one is in possession of all the structure and a sizeable vocabulary of a second language." (1:305)
>
> Sister Mary and Arthur Carrow--"...no significant differences between the language groups in favor of the monolingual group in tests of oral reading comprehension, hearing vocabulary, arithmetic reasoning, and speech vocabulary. 2. No significant difference was founf between the language groups in silent reading comprehension, silent reading vocabulary, oral reading rate, spelling, vocabulary output, length of

> clause, degree of subordination. 3. The bilingual group made more and different types of grammatical errors than the monolingual group." (60:371-380)

> Madorah E. Smith--In direct contrast with the previous study cited, she found that the bilingual child was "retarded" in both languages as measured by the length of his sentences. In dealing with Hawaiian children she found that the monolingual child spoke 20% more words than the bilingual child. (61) (62:692-693)

> Wallace E. Lambert--"Our results clearly show that bilingual students are far superior to monolinguals on verbal and non-verbal tests of intelligence."(44:121)

> Walter Kaulfers--"...if the monolingual twin...should enter a school for English-speaking children, he would have a distinct initial advantage...comparison in terms of valid tests have not been possible ...such data as are available have served more to reinforce preconceived assumptions than to clarify the problem." (38:520)

These statements (with the exception of those by Smith) undermine the bilingual argument which postpones the optimum age for beginning a second language to adolescence or adulthood. Perhaps as Enar Haugen and Leopold Taillon (2:305) point out, bilingualism has been confused with biculturalism. Therefore, local decisions for postponing the introduction of a second language would be justified on the grounds of bicultural tensions.

THE IMPACT ON LATER LEARNING

Anne S. Hoppock examines the conclusion that students who start early will be much further along. She cites the cases of pupils who had six years of instruction in French before entering high school but are still only placed in second-year French classes. (30:269-270). Others claim that students with FLES backgrounds achieve the same scores after two years of high school experience as those without the FLES background. C. E. Johnson counters this argument (37), explaining that by both groups receiving the same high school materials there is little opportunity to make full use of FLES backgrounds. These high school repetition courses become boring to FLES graduates and not only retard but almost reverse the benefits of the earlier FLES stimulation and progress. Johnson and his associates propose a double track system to alleviate this problem. (33:283-286) Carroll's research reveals that the impact of a foreign language on later learning in that language is slightly positive:

> ...Students with previous foreign language training tended to get slightly better marks than their controls (control group) in the first high school language course...(19:14)

Anne Hoppock's research leads one to become less optimistic. However, even though she and her associates dismiss the transfer power of formal instruction in one language, they do find that "children in the elementary school are better off for having informal, meaningful experiences with several languages in the setting of the cultures involved." (30:270) This kind of program reports to develop a kind of general readiness for communication.

EXPLANATIONS, TESTIMONIES, AND RECOMMENDATIONS

Elizabeth Ingram explains that the problem of when to introduce a foreign language is not whether it is better to introduce a language at age six, twelve or twenty but a problem of chosing the best methodology for each of these levels:

> Efficient language teaching should capitalize on the advantages and minimize the disadvantages of each of... the very different types of learners. (32:18-24).

Men like David Ausubel whose background favors the theoretical advantages of cognitive learning, naturally postpone the teaching of foreign language to the later years (adolescence and adulthood) when this ability has developed. However, for a very different reason the bahaviorist Thorndike believes that the results of attempting to teach children another language are simple not commensurate with the time and effort spent. (9:13)

Teaching the young child (usually before the third grade) a foreign language is an even more controversial issue than teaching it in the intermediate grades. Alice Miel (51:144), Nicholas Hobbs (28:17), Walter Kaulfers (38:518), Georgina Hicks (27:29-31) and Mary Fisher (18:70) are against beginning a foreign language during this "early" childhood. However, the chronological age was not a limiting factor when the precociousness was introduced as a variable.

The data if judged by quantity seems to give overwhelming support to FLES programs. However, as indicated below the curriculum planner can find very little agreement on one particular grade level for beginning a FLES program or more importantly a standard set of objectives to guide his decision making:

> Toyota--"the earlier the child is introduced to a foreign language, the better his pronunciation will be..." (10:1091)
>
> Carlyle G. Hoyt--"We deliberately chose grade 3 in Fairfield for the start of our program to allow children to begin reading in grades 1 & 2... at the same time eight-year-olds are not afraid to mimic the strange sound they hear. Their native curiosity has not been subdued." (31:506)
>
> Margit McRea--"Fourth graders have reached a stage of relative security in regard to reading, and writing English without losing their interest in, or ability to imitate new sounds. (50:510)
>
> Daniel P. Girard--"... up to 12...can imitate accurately and learn one or more foreign languages without being self-conscious." (21:270)
>
> Merrill V. Goudie--"The Modern Language Association recommends beginning a foreign language in third grade and carrying it through elementary school to high school." (22:320)
>
> Dorette Walnes--"I am of the firm conviction that the first grade is the ideal time to initiate foreign language study because...that age group indicates more positive responses to the necessary exercises, imitations, and routine."(67:80)

> Francis V. Lloyd and Marjoriee Pei recommend beginning in grade 3 and continuing through grade 7 for the "academically able". (48:127-129)
>
> Leonor Larew--"Psychologists and linguists seem to agree generally that early childhood is the time for the second language learning. Educators and foreign language teachers tend to feel that there is insufficient research..."(46:205)

IN CONCLUSION

The FLES programs have nearly doubled over the last decade (29:243-255). With the involvement of increasing numbers of children, parents and teachers, the controversy over the optimum time for beginning a foreign language has been extended. Research continues to grapple with the problem. Men like John Carroll rest the problem with research:

> ...if research does not clearly indicate whether learning in general is better in childhood or adulthood, still less does it indicate exactly when foreign language instruction should begin. (19:13)

Others like Leornor Larew feel it is the educators and foreign language teachers who are arresting progress. (46:205)

Perhaps the diversity of opinions stems from the mistaken idead that one can turn to research for a "simple" answer. Research can provide enough evidence to launch a program if a school has formulated a well-defined set of objectives. Because the ends (objectives) are really tied with the means, however, a well-developed methodology of foreign language teaching also becomes a crucial factor. Young children may lack the mature conceptual powers of adults but reportedly seem to learn very easily to imitate sounds and benefit from the early introduction of language during their years in grade school. However, the school must be willing to budget the necessary funds for audio-visual equipment, stimulating teachers,and follow up programs to ensure success with an oral approach and the goal of verbal fluency.

Aside from the physiological and neurological research there have been comparatively few efforts made to justify the reasons behind the popular opinion that foreign language learning is "easier" for elementary children. Despite the research of Piaget (6:32), Thorndike, Ausabel (3), Hildreth, Osgood, Milner, and Ferguson (43), "how language can be learned..." remains at worst, "one of the unsolved mysteries..." (1:299) at best a controversy demanding further research (63:102)

The often cited successes of adult foreign language programs may stem from the necessity of their stiuation. If the motivational factor were more carefully analyzed, the differences between given "adult versus children" studies would probably be better understood. Adults do display greater ability to utilize conceptual thinking but most of the research indicates that this offers little help to the novice dealing with foreign sounds. The efficiency of quickly applying the rules falls short, it seems, of the value of natural speech patterns. If there is a possibility that foreign sounds are more easily assimilated by younger children it seems wasteful not to capitalize on this period. In later years no doubt the speed of learning will increase even without this previous experience. However, there have been programs which have been designed without sacrificing either of these periods of learning and these report the largest numbers of successes. Perhaps the most recent cases in point are the Johnson, Flores, and Ellison pupils whose early training and continuous study have made them even more successful than high school students in a recent nation-wide foreign language contest.

However, if funds or equipment necessitate limiting the school's objective to either imitative speaking or conceptual skills then in essence one has made the choice between early or late learning.

This paper has attempted to enumerate and clarify the studies which substantiate the widely held beliefs as they apply to the "optimum time for foreign language learning:" the majority undermine the idea of "bilingual retardation" and uphold the idea of "positive transfer" as it applies to foreign language.

In time a more scientific approach to the problem will eleminate the difficulty of too many variables. Educators will then have less difficulty in sorting the evidence for determining the school's objectives. In the meantime they can benefit from their search for the answers by being temporarily freed from the static practices often associated with "settled" matters. Perhaps too, in the search for the answers to the question of the optimum time for foreign language instruction, teachers and researchers will uncover concepts of significance to other areas of the curriculum.

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THE UNIVERSITY OF GEORGIA

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19TH TEACHER EDUCATION CONFERENCE

Theme: THE IMPLICATIONS OF EARLY EDUCATION STIMULATION IN LISTENING FOR TEACHER EDUCATION

LISTENING*

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THE IMPLICATIONS OF EARLY EDUCATION STIMULATION IN LISTENING FOR TEACHER EDUCATION

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In the last decade, curriculum specialists in the Language Arts have expanded the modern trivium of reading, writing, and speaking to include listening. The logic of this development is clear. If reading is the receiving counterpart of the "sending art" of writing, then listening should be recognized as the counterpart of speaking.

But recognition as a family member does not solve the definition problem let alone the problems of curricular construction and implementation. Like any new progeny, this latecomer into the Language Arts must be named and nurtured.

It will be the purpose of this paper to define listening as a process, classify its types, demonstrate need for its improvement, summarize some of the results of research in the area and describe selected methods of teaching it.

DEFINITION

Listening will be defined as the selective process by which sounds coming from some source are received, recognized, and interpreted by a person in terms of past experience and future action. Though the term auding has been introduced (12) to eliminate the ambiguity of the word listening, it has not gained wide acceptance.

Though the index in Duker's Listening Bibliography (23) lists thirty-nine (39) kinds of listening, the classification of Barbe (5) into appreciative, critical, and discriminative is most useful.

NEED FOR LISTENING IMPROVEMENT

In determining reasons for the teaching of listening we are inevitably taken back to Rankin's 1928 study (55) which pointed up listening in adults as the most frequently used communication skill, comprising 42 per cent of the communication time as compared to reading 15 per cent; talking, 32 per cent; and writing, 11 per cent. Miriam Wilt's classroom observations led her to conclude that 54 per cent of the elementary children's classroom time was spent listening to the teacher. (67) This is not to infer that we should spend a proportionate amount of time on listening instruction. There does not, however, seem to be any standard offering for teacher training if Markgraf's 1960 study (48) is representative. He found that 84.3 per cent of his educator respondents believed that high school and elementary teachers should endeavor to teach listening, but only 44.5 per cent of the instructors included a unit on methods of teaching listening in either Speech, English, or Education courses.

A compelling reason for increasing the listening training of first grade and pre-school children lies in their "listening readiness." Smith (59) found that first grade children had an average listening vocabulary of 23,700 words (16,900 basic and 6,800 derived words) with a range from 6,000 to 48,000 words. To benefit from this head start aural vocabulary, pretested, successful listening methods need to be introduced and efficient listening habits inculcated early. Further, since parents and teachers do not seem to agree on identifying poor listeners (60) it would seem that the sooner the child is exposed to the more receptive environment, the better.

When we ask simply why children listen the need is again underscored. They are required to listen for information in order to learn. They need to be able to listen in order to follow directions, to participate in discussion and planning, to become courteous, to become discriminating and critical, and to use listening for appreciation and enjoyment. These, then, should be the basic goals of any listening program.

That we fail to achieve these objectives in early school is apparent in the number of poor listeners we confront as adults. According to Nichols (51), who has published more than anyone else on this subject of listening, ten poor listening habits are: (1) calling a subject dull, (2) criticizing a speaker, (3) getting over stimulated, (4) listening only for facts, (5) trying to outline everything, (6) faking attention, (7) tolerating distractions, (8) choosing only what is easy to listen to, (9)allowing emotion-laden words to interfere with listening and (10) wasting the time differential between speech and thought speed.

As Sister Mary Weir expressed it, "A world that listens nearly half the waking hours needs teachers who think skill in listening is important."(62) For this and the other reasons above, the need for programs of listening seem valid.

FACTORS AFFECTING LISTENING

Factors in the speaker.

Does the speaker's behavior affect the listener's recall and retention? No studies have shown this on the primary level, so other representative findings will be noted. Knower, et al. (41) found that, where there is equal quality of performance, speaking from memory is more effective in securing comprehension and retention by the listeners than reading a speech from a text. Nichols (51) found the audibility of the speaker to be an influencing factor although Kavanaugh's (38) investigation of the most comfortable listening levels for the speech revealed a wide variation among listeners.

Fergen (30) presented material orally at 80, 130, 180 and 230 words per minute and found that listening comprehension was best at 130 words per minute with satisfactory comprehension at all speeds. Compressed and "chopped" speech studies show promise of increasing the words per minute. At a given speed the degree of intelligibility of speeded speech is significantly higher when the tape is chopped than when the tape is merely run rapidly. The size of the chop is the critical factor. (31, 32) Adding key redundant words increases comprehension. (29)

Factors in the listener

The relationship between listening test scores and various abilities and characteristics of the listener have often been investigated. Since 1948, for example, thirty-one (31) studies have included correlations between intelligence and listening. All of the correlations the writers could locate were positive with fifteen (15) being above .50. Fourteen of the studies used elementary school populations.

In Kegler's study (39) of grades 8, 10, and 12, he concluded that students (especially boys) who are poor readers are likely to have larger listening vocabularies than reading vocabularies. Though most studies show no sex differences in listening King found boys tend to return high mean scores on oral tests and girls on the visual tests. (40)

Other factors in the listener found by Nichols to be influencing comprehension are recognition of correct English usage, size of the listener's vocabulary, ability to make inferences, ability to structuralize a speech, listening for main ideas as opposed to specific facts, use of special techniques while listening to improve concentration, real interest in the subject discussed, emotional adjustment to the speaker's thesis, ability to see significance in the subject discussed, curiosity about the subject discussed, and physical fatigue of the listener. (51)

Factors in the Speech

Under this general heading are found studies concerning difficulty, organization, and repetition of speech content. For example, Goldstein found, as one might predict, that superiority of listening is greater when easy materials are used than when difficult materials are used. (33) Beighley's experiment (9) with college students showed that the degree of organization of a speech had little effect on comprehension and Ehrensberger (28) reported that repetition either early or late in a speech has a positive effect on recall.

Factors in the Situation

Environmental factors sometimes play an important part in determining listening effectiveness. Henneman (36) and Nichols (51) found that distraction does interfere significantly with listening comprehension and O'Neill (52) showed that college speech students were more proficient in listening to consonants, vowels, words, and phrases, when they could see the speaker at close range than when they did not see him.

Relation to Other Language Arts

Though it is not the purpose of this paper to consider this broad topic at any length, two or three observations should be made. The oral presentation seems to be most effective with children with a mental age of 13 and below. Those above 13 do better with visual presentation. (16) As a result of Welsh's factor analysis of sixty first through third graders, he concluded that listening ability is a central factor with no direct relation to reading ability. (63) This is not borne out by Hall, for example, who states that listening is not a generalized ability but a cluster of specific abilities closely related to the listening task. (35)

The same kind of contradiction occurs in trying to synthesize other research. Following a review of research done to determine whether reading or listening was superior, Witty condluded that any difference in learning efficiency may be traced not to the visual or to the auditory presentation but instead to factors such as the difficulty or nature of the material to be learned, the way in which it is presented, and its suitability in terms of the experience and interests of the group. (68) We would concur with Witty's further observation that we should stop trying to assign superiorities and begin to assess what relative emphasis should be given to silent and oral presentations throughout the elementary grades.

Methods of Teaching Listening

If the need for better listening is pressing and results of research indicate significant improvement from training in listening, when and how, then, should we teach this skill?

Four different approaches to teaching listening have been noted: direct, indirect, integrated, and eclectic. (10) The direct method would include such activities as these. 1. The teacher reads selections to the class and the children select the main idea from possible answers read to them. Allowing the children to prepare their own selections to be read to the class for purpose of selecting of main ideas may well follow. 2. While listening to a selection, the class lists the transitional words or phrases they hear. (14)

The indirect method assumes that in the teaching of other subjects, especially in the primary grades, there is inevitably a substantial amount of listening being taught since responses must be made to giving directions, requests to relate "what the story was about," and the like.

Sister Mary Weir has exemplified the integrated approach by making an analysis of the McKee English Series for activities which when used for one purpose can at the same time be used to develop listening skills. (62) In a columnar breakdown, she matches the texts' content with the following oral language situations:

A. Telling stories
B. Using the telephone
C. Making reports
D. Following directions
E. Enjoying poetry
F. Participating in dramatizations
G. Telling creative stories
H. Telling riddles
I. Making introductions
J. Relating personal experiences
K. Holding conversations
L. Giving descriptions
M. Improving one's vocabulary
N. Using words correctly

In another column are listed the objectives for developing the specific skill desired. From this breakdown, the teacher should increase the skill of the child in six different types of listening: 1. Conversational; 2. Appreciational; 3. Creative; 4. Exploratory; 5. Critical; 6. Intent.

The eclectic approach purports to draw from all methods depending on the grade, subject, level of class, etc.

Basic principles of learning which seem to apply to the teaching of listening in the elementary school have been stated by Lewis. (42)

A. Children learn what they practice.

B. Children need to understand what it is that they are trying to learn.

C. Children need to become aware of their ability to listen.

D. Children need opportunities to discover that they can improve their listening ability.

E. Oral reading should be taught so that it fosters good listening.

F. Oral language is taught with an emphasis upon communication.

G. Children have opportunities to listen to difficult material read to them by the teacher.

H. Individual differences in listening should be recognized.

How these principles are implemented in the curriculum illustrated by excerpts from three schools' curriculum handbook or bulletin. (61)

A. New York City Board of Education, Language Arts, Grades 1-6. Curriculum Bulletin, No. 4, 1954-55 Series.

1. Communication skills are interdependent

2. They have three levels for grades one through six; listening situations are offered as well as the characteristics for the good listener.

3. For example, at the first level (grades 1-2) the listening situations presented included listening to: (1) the speaker in conversation and dramatization, (2) the dictation of others, (3) simple directions (4) stories, puzzles, and poems, (5) the teacher reading passages from books to answer questions, and (6) mechanical devices such as radio, television,records, sound motion pictures, public address systems, and such sounds as bells, the wind, the clock, machinery, and birds in order to develop concepts as louder, softer, harsh, and shrill.

B. Brentwood Public Schools, A Handbook in Language Arts - Speaking, Writing, Listening, and Handwriting. Brentwood 17, Missouri, Compiled, 1952-53.

1. Included in the handbook are the following suggestions for classroom teachers.

(1) teachers should be sensitized to the importance of skillful listening as a factor in intelligent communication.

(2) children should have more experiences in planned speaking and listening with their peer groups - with less time devoted to listening to the teacher.

(3) group discussion should be emphasized

(4) oral reading should consist of materials that are fresh, interesting, and meaningful to the children.

(5) a wide variety of listening experiences should be introduced into the classrooms.

C. Akron Public Schools, Curriculum Handbook - Reading and Literature, Oral and Written Communication. Akron, Ohio, 1956.

1. The teacher plays an important role in preparing the class for listening. She can be most helpful in this respect if she: (1) Regards what the child has to say as important, (2) Helps the pupil choose content suitable to the interest and maturity of the group. (3) Plans with the children so that they sense the purpose for which they are listening in a given situation, (4) Helps the group set up standards for listening. (5) Provide many opportunities for child participation by answering, questioning, adding to, and discussing what they have heard. (6) Makes provision for children to participate in follow-up experiences in drawing, dramatization, telling, constructing and writing. (7) Guides children to judge the value of what they have heard, (8) Plans seating arrangements so that the children may face one another, and (9) Adjusts the length of listening time to the maturity of the group.

2. A list of questions are presented so that a child may check his own listening habits. Several of the more important questions are (1) Do I get ready to listen? (2) Do I look at the speaker? (3) Do I keep my mind on what is being said. (4) Can I select the main idea? (5) Can I recall in sequence? (6) Can I follow directions I hear? (7) Can I retell what I hear?

Implications

The necessity of relating results of studies directly related to listening has precluded our drawing from other potentially productive areas such as psychology, social psychology, psycholinguistics, etc., whose research in more basic processes such as perception and learning may well modify what we write tomorrow. Some studies mentioned here of course were based on the newer learning theories.

Certainly the advent of the "new English" with its emphasis on good literature will make listening more attractive to teach. But if we have returned to the ancients (with Greek mythology) for upgrading our content, we must anticipate the future in planning our methods. The trends of the recent past become the standard procedure in many cases of the future. For example, downgrading is implicit in this study. The next step will be to write a series of listening training exercises for kindergarten and/or nursery school children dealing with such factors as following directions, discriminating between sounds, identifying rhymes, grasping the main idea of a passage, recognizing relationships, using contextual clues to get a main idea, and drawing inferences. In devising methods of stimulation the possibilities of compressed speech television and programed series including vocabulary and storytelling lessons are being considered.

Out of the training exercises might be developed a listening readiness test which would diagnose for listening deficiencies, help increase the efficiency of returning information, and would help predict reading readiness.

The field of listening has catapulted into language arts prominence in the last fifteen years. Irrefutable findings are few and those reported here represent only a start in a promising art. Our efforts will have to be redoubled to enable this art to provide students with new methods of efficiency to keep pace with the exploding knowledge about us.

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The authors suggest that the most important emphases in teaching listening are on syntax and on evaluating speakers' ideas.

2) Anderson, Rhea, Minshall, Lucille, and Comfort, Iris Tracy. "How to Teach Better Listening." N.E.A. Elementary Instructional Service Leaflet. Washington: National Education Association, 1962.

A compact statement of the essentials of the teaching of listening. Suitable for distribution to a school staff as an introduction to this topic.

3) Anilla, Sister Mary. "Accuracy Is the Goal: Language Skills." National Catholic Educational Association Bulletin 60(1):402-07, August 1963.

Common factors in all language arts are vocabulary, auditory discrimination and organization of ideas. Physiologically and psychologically listening comes first and thus undergirds the whole language arts program. Listening is a difficult process of thinking; a process by which what is heard is weighed, analyzed, sorted, related, classified, evaluated and judged.

The primary-grade child is receptive to the teaching of listening skills when he is interested in what is being said and when the general atmosphere is conducive to listening.

4) Applegate, Mauree. "To Listen Imaginatively." Grade Teacher 74(4):38, December 1956.

Some specific techniques for teaching listening at the elementary school level: encourage children to have a purpose in listening; use the information listened to in some way; play listening games; have older children learn to make notes on speaker's remarks; urge children to see mental picture of what they are listening to and to evaluate the speaker and the content of the speech.

5) Barbe, Walter B. and Meyers, Robert M. "Developing Listening Ability in Children." Elementary English 31:82, February 1954.

6) Beery, Althea. "Experiences in Listening." Elementary English 28:130-32, March 1951.

Teachers need to analyze their own listening habits and encourage thoughtful study of listening situations by children. As children develop concern for their own listening competence a more effective meeting of minds in the classroom will occur as a result.

7) ----. "Interrelationships Between Listening and Other Language Arts Areas." Elementary English 31:164-72, March 1954. Reprinted: National Conference on Research in English. Interrelationships Among the Language Arts. Chicago: National Council of Teachers of English, 1954, p. 34-42.

Since listening and reading are closely related, the elementary school teacher should take advantage of this fact by developing both reading and listening simultaneously and not attempt to thwart a relationship between the two.

8) ----. "Listening Activities in the Elementary School." Elementary English Review 23:69-79, February 1946.

Specific suggestions for the teacher of listening at the elementary level include: sensing the relationship between listening and other phases of communication; understanding the psychological process of listening; providing conditions in the classroom that are conducive to listening; utilizing opportunities for listening; understanding the developmental levels and goals of the listening process; and being alert to new equipment and devices which will aid the program of teaching listening.

9) Beighley, Kenneth C. An Experimental Study of the Effect of Four Speech Variables on Listener Comprehension. Doctoral dissertation. Columbus, Ohio: Ohio State University, 1952. Excerpts: Speech Monographs 19: 249-58, November 1952 and 21:248-53, November 1954, and Journal of Communication 2(2):58-65, November 1952.

10) Bird, Donald E. "Listening." NEA Journal 49(8):31-33, November 1960.

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A twenty point list of essentials for a teacher of listening is given with emphasis on the need for integrating the teaching of listening with all other school subjects.

12) Brown, Donald Pardie. "Concepts and Practices in Teaching Aural English." English Journal 45:540-46, December 1956.

13) Burns, Paul C. "Teaching Reading in the Elementary School." Elementary English 38:11-14, January 1961.

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14) Canfield, George Robert. "Approaches to Listening Improvement." Elementary English 35:525-28, December 1958.

15) Cashman, Mildred Berwick. "Channel L-I-S-T-E-N." Education 82:50-52, September 1961.

Mispronunciation by young children may, in some cases, be a sign of difficulty in listening rather than speech difficulty. Cashman suggests giving listening practice in the elementary grades on three levels: specific concepts without details; with some detail; and with many details.

16) Caughran, A. M. *The Effect on Language Comprehension of Three Methods of Presentation*. Doctoral dissertation. Columbia, Mo.: University of Missouri, 1953. Abstract: *Dissertation Abstracts* 13:1113, 1953.

17) Cole, Sister Mary Ethel. *The Effect of Intensive Instruction in Listening Comprehension with Different Intelligence Groups in Grade One*. Master's thesis. Milwaukee, Wisc.: Cardinal Stritch College, 1961.

Using a group of 141 first-grade pupils in four classes as subjects, the author found that a 15-minute daily listening lesson for some groups resulted in substantially greater improvement for them in both reading and listening compared to the reading and listening ability of groups having only conventional language arts instruction.

18) Commission on the English Curriculum of the National Council of Teachers of English. *Language Arts for Today's Children*. New York: Appleton-Century-Crofts, 1954. Chapter 4, "Listening," p. 71-105.

This thought-provoking discussion of the role of listening in the elementary classroom deals with reasons for teaching listening, the nature of listening, conditions fostering effective listening, developmental levels in listening, classroom activities involving listening, and ways of improving listening ability. It is emphasized that listening should be developed in a general language arts context rather than as an isolated separate item in the curriculum.

19) Crink, Cedric L. and Buntley, Arline. "Learn to Listen." *Grade Teacher* 72(3):51+, March 1955.

Nine kinds of listening that should be taught in the elementary school are listed: casual, conversational, background, appreciative, creative, explanatory, interrogative, concentrated, and critical.

20) Dawson, Mildred A. and Zollinger, Marian. *Guiding Language Learning*. Yonkers, N. Y.: World Book, 1957. Chapter 7, "Helping Children to Listen Effectively," p. 160-92.

The authors suggest, as means for developing more effective listening on the part of pupils, that the classroom atmosphere be relaxed, comfortable, and quiet, and thus conducive to listening; that the teacher take advantage during the day of opportunities for listening; that children sense a suitable purpose for listening; that pupils be led to expect meaning whenever they listen; that pupils be prepared for what they are about to hear; that long periods of listening be broken up by other activities; that the occasion for listening suit the circumstances and the maturity level of the children; that pupils be guided in evaluation of what they hear; that opportunities be arranged for the reproduction of the material listened to; and that children set up standards for effective listening.

21) Dills, Eva. L. *Listening the Key to Learning, Including the Results of Listening Projects Carried out in the Alfred I. DuPont and Faulk Road Schools, Wilmington, Delaware*. Master's thesis. Newark, N. J.: New Jersey State Teachers College at Neward, 1955.

This is a good review of the importance of listening in various aspects of social living. A fourth grade program to improve listening is described. It included reading stories aloud, practice telephone conversations, following directions, emphasis on listening on trips, vocabulary practice, socio-drama to illustrate courtesy, and writing or taping contents of oral presentations.

22) Doyle, Loretta. "Methods for Improving Oral Expression in Kindergarten Through Grade Three." *In Oral Aspects of Reading*, Proceedings at the Annual Conference on Reading, Chicago: University of Chicago Press, 1955, p. 36-39.

Good speech patterns help listening habits grow. Speakers must be made aware of their responsibility to their listeners. Teachers should not insist that children listen to ill-prepared speakers or to material beyond their understanding. One of the best aids to oral reading is responsiveness of the listening group.

23) Duker, Sam. *Listening Bibliography*. New York: The Scarecrow Press, 1964.

The most current, definitive bibliography; contains 888 annotated items.

24) ----. "Goals of Teaching Listening Skills in the Elementary School." *Elementary English* 38:170-74, March 1961.

The ten qualities that should be developed in the elementary school teaching of listening skills are the art of actually listening, selective listening, skillful listening, critical listening, courteous listening, attentive listening, retentive listening, curious listening, reactive listening and reflective listening.

25) ----. "How Listening Can Be Taught." *Instructor* 64(9):35+, May 1955.

A description of the actual experiences in teaching listening of a group of elementary school teachers.

26) Eastman, Milton. "Listen!" *Grade Teacher* 81(1):56+, September 1963.

Elementary school teachers should not talk continuously. They should use pleasant, modulated voices, not resort to tiresome repetition, and be more aware of the physical limitations of individual pupils. If good listening habits are to be taught, focus must be on listening throughout the day. A list of activities useful to the teaching of listening is given.

27) Edgar, Kenneth Frank. *The Validation of Four Methods of Improving Listening Ability*. Doctoral dissertation. Pittsburgh, Pa.: University of Pittsburgh, 1961. Abstract: *Dissertation Abstracts* 22:1084, 1961.

Using as subjects 340 fourth through sixth grade children in an eight week experiment, the author found that the experimental group made a significantly greater gain in listening ability. The results were measured by an author-made test. Listening was taught by practice on taped material: expository, continued story of adventure, unconnected paragraphs, and word lists. The listening test, the text of which is given, was designed to measure ability to observe single details, to keep related details in mind, to remember a series of details, to follow oral directions, to use contextual clues, to recognize organizational elements, to differentiate main and subordinate ideas, and to draw justibiable inferences.

28) Ehrensberger, Ray. "An Experimental Study of the Relative Effectiveness of Certain Forms of Emphasis in Public Speaking." *Speech Monographs*. 12:94-111, 1945.

29) Fairbanks, Guttman, Newman, and Miron, Murray S. "Auditory Comprehension in Relation to Listening Rate and Selective Verbal Redundancy." *Journal of Speech and Hearing Disorders* 22:23-32, March 1957.

30) Fergen, Geraldine K. *Listening Comprehension at Controlled Rates for Children in Grades IV, V, and VI*. Doctoral dissertation. Columbia, Mo.: University of Missouri, 1954. Abstract: *Dissertation Abstracts* 15:89, 1955.

31) Garvey, W. D. *Duration Factors in Speech Intelligibility*. Master's thesis. Charlottesville, Va.: University of Virginia. 1949.

32) ----. *An Experimental Investigation of the Intelligibility of Speeded Speech*. Doctoral dissertation. Charlottesville, Va.: University of Virginia, 1951. Summary: "The Intelligibility of Speeded Speech." *Journal of Experimental Psychology* 45:102-08, February 1953.

33) Goldstein, Harry. *Reading and Listening Comprehension at Various Controlled Rates*. Teachers College, Columbia University Contributions to Education, No. 821. New York: Bureau of Publications Teachers College Columbia University, 1940.

34) Gruszcynski, Sister Mary Lauriana. *An Experimental Study of Functional Reading and Listening Skills in the Fourth Grade*. Doctoral dissertation. New York: Fordham University, 1957.

The Hollow Listening Test was administered to 400 pupils. The author reports that direct instruction was significantly more effective than incidental teaching of listening skills.

35) Hall, Robert Oscar. *An Exploratory Study of Listening of Fifth Grade Pupils*. Doctoral dissertation. Los Angeles, Calif.: University of Southern California, 1954.

36) Henneman, Richard H. "Vision and Audition as Sensory Channels for Communication." *Quarterly Journal of Speech* 3 :161-66, April 1952.

37) Hoffman, Miriam. "Our Listening Center Livens Language Arts." Elementary School Journal 63: 381-85, April 1963.

This is a description of a listening center made in the school shop and which enables a number of children to listen to recordings of literature on ear phones. This kind of activity aids in the development of listening skills.

38) Kavanagh, James Francis. An Investigation of the Most Comfortable Listening Levels for Speech. Doctoral dissertation. Madison, Wisc.: University of Wisconsin, 1960. Abstract: Dissertation Abstracts 20: 4458-59, 1960.

39) Kegler, Stanley Benjamin. A Comparative Study of the Size and Nature of Reading and Listening Vocabularies. Doctoral dissertation. Minneapolis, Minn.: University of Minnesota, 1958. Abstract: Dissertation Abstracts 19: 2602, 1959.

40) King, W. H. "An Experimental Investigation into the Relative Merits of Listening and Reading Comprehension for Boys and Girls of Primary School Age." British Journal of Educational Psychology 29: 42-49, February 1959.

41) Knower, Franklin H., and Phillips, David, and Koeppel, Fern. "Studies in Listening to Informative Speaking." Journal of Abnormal and Social Psychology 40: [illegible]-88, January 1945.

42) Lewis, Maurice S. "Teaching Children to Listen." Education 80:455-59, April 1960.

43) "The Listening Skills." Supervisor's Notebook. Scott Foresman Co. No. 979, February 1957, p. 1-4.

44) McBrian, Donna Jeanne Benson. An Experimental Study of the Effectiveness of a Planned Program Designed to Teach Certain Listening Skills. Master's thesis. St. Paul, Minn.: Macalester College, 1962.

Using the Kuhlman-Anderson as a test of intelligence, the Iowa Basic Skills as a test of reading and the STEP as a test of listening, McBrian gave a series of 21 lessons in listening to 164 fifth grade pupils. No significant differences were found to have occurred as a result of the lessons.

45) McCormack, Sister Mary Eulogius. An Experimental Study of the Effect of the Effect of a Concentrated Program of Listening Comprehension Skills on Reading Comprehension of First Grade Pupils in Selected Schools in Massachusetts. Master's thesis. Milwaukee, Wisc.: Cardinal Stritch College, 1962.

A well-performed experimental study showed that a group of 44 students given systematic listening instruction over a period of six months gained significantly over a control group in total reading, reading sentence comprehension, and paragraph comprehension. Texts of tests used and of some exercises for teaching listening are included.

46) MacDonnell, Sister M. Patrina. An Experimental Study of the Effect of Intensive Training in Listening Skills on Reading and Spelling Achievement in Grade One. Master's thesis. Milwaukee, Wisc.: Cardinal Stritch College, 1962.

Using in her thesis the materials developed by McCormack, MacDonnell found that, as a result of three months of systematic listening instruction, the experimental group made significantly greater gains in reading and listening, but not in spelling, than the control group.

47) McPherson, Irene. The Effect of Direct Practice in Listening on Certain Reading Skills. Master's thesis, Greeley, Col.: Colorado State College of Education, 1951.

The improvement on a reading test by a group of 65 second grade pupils who had been given 30 practice exercises in listening was statistically significantly greater than that of a control group of the same size.

48) Markgraf, Bruce Richard. A Survey of Listening Pedagogy in American Teacher-Training Institutions. Doctoral Dissertation. Madison, Wis.: University of Wisconsin, 1960. Abstract: Dissertation Abstracts 21:699-700, 1960. Summary: Journal of Communication 12:33-35, March 1962.

49) Marsden, W. Ware. A Study to Determine the Effect of Training in Listening upon Ability to Listen. Doctoral field study. Greeley, Col.: Colorado State College of Education, 1953. Abstract: Abstracts of Field Studies for the Degree of Doctor of Education, 15:111-13, 1954.

Using 100 fifth and sixth grade pupils as subjects, Marsden reports that systematic instruction in listening resulted in significantly greater gains in listening than when no such instruction was given. Measurements were made by the oral administration of the Chicago Reading Test.

50) Nashville Public Schools. "Experiences in Listening." (mimeographed). Nashville, Tenn., 1951.

An extensive and extremely useful list of various techniques used in the teaching of listening.

51) Nichols, Ralph G. Factors Accounting for Differences in Comprehension of Materials Presented Orally in the Classroom. Doctoral dissertation. Iowa City, Iowa: State University of Iowa, 1948. Abstract: Speech Monographs 15:154-63, 1948.

This thesis, which is a pioneering and ground-breaking one on listening, is the most frequently referred to of any on the subject. Two-hundred college freshmen listened to six ten-minute lectures dealing with various curricular areas. In addition to being tested for comprehension and retention of material in the lectures, the subjects were given a battery of tests in various areas of skill and aptitude. Students submitted answers to questionnaires about their listening habits and procedures. The 20 lowest and highest students were interviewed in depth. In the judgment of these college freshmen, factors involving mental set and possession of certain skills were more important to listening ability than factors involving susceptability to distractions or emotional maladjustment. Correlations of listening with intelligence of .53 and of listening and reading of .46 are reported.

52) O'Neill, John Joseph. Contributions of the Visual Components of Oral Symbols to the Speech Comprehension of Listeners with Normal Hearing. Doctoral dissertation. Columbus, Ohio: Ohio State University, 1951.

53) Potter, Mary and Thurlow, Dorothy. "Listening in the Language Arts." Elementary English 40:757+, November 1963.

A description is given of a program for training first- and second-grade children in listening by means of tape recordings. The skills of following directions and self-checking of phonics were emphasized.

54) Pratt, Lloyd Edward. The Experimental Evaluation of a Program for the Improvement of Listening in the Elementary School. Doctoral dissertation. Iowa City, Iowa: State University of Iowa, 1953. Abstract: Dissertation Abstracts 13:1118-19, 1953. Summary: Elementary School Journal 56:315-20, March 1956.

In a carefully performed and controlled experiment in 40 sixth grade classes, Pratt found that lessons in listening over a period of five weeks resulted in an improvement in listening skills, as measured by an author-made test, which was greater than that shown by the control group. Lessons and two forms of the test used are included.

55) Rankin, Paul T. The Measurement of the Ability to Understand Spoken Language. Doctoral dissertation. Ann Arbor, Mich.: University of Michigan, 1926. Abstract: Dissertation Abstracts 12:847, 1952. Excerpts and summaries: "The Importance of Listening Ability." English Journal College Edition 17:623-30, October 1928; "Listening Ability." Proceedings of the Ohio State Educational Conference, Ninth Annual Session. Columbus, Ohio: Ohio State University, 1929, p. 172-83; "Listening Ability: Its Importance, Measurement and Development." Chicago Schools Journal 12:177-79, January 1930 and 12:417-20, June 1930.

56) Robinson, H. Alan. "The Directed Listening Activity." Report of the 13th Annual Conference and Course in Reading. Pittsburgh, Pa.: University of Pittsburgh, 1957, p. 79-87.

The author develops a plan for teaching listening parallel to directed reading activity composed of readiness, concept development, listening, discussion, and re-listening when possible.

57) Russell, David H. and Russell, Elizabeth F. Listening Aids Through the Grades - One-hundred-Ninety Listening Activities. New York: Teachers College, Columbia University Bureau of Publications, 1959.

58) Shepherd, Terry R. A Study of the Effectiveness of Listening Instruction in Grades Five and Six. Master's thesis. Charleston, Ill.: Eastern Illinois University, 1962.

In an uncontrolled experiment using 323 fifth and sixth grade pupils as subjects, Shepherd found that two weeks of intensive instruction in listening, which stressed reasons for listening and principles of listening, resulted in a statistically significant improvement in listening as measured by the STEP Test.

59) Smith, Mary K. "Measurement of the Size of the General Vocabulary through the Elementary and High School." Structure Psychology Monographs 24: 311-345, 1941.

60) Trivette, Sue Eloise. An Investigation of the Effect of Training in Listening for Specific Purposes. Master's thesis. Johnson City, Tenn.: East Tennessee State College, 1959. Summary: Journal of Educational Research 54:276-77, March 1961.

61) Wagner, Guy W. "What Schools Are Doing in Developing Listening Power." Education 78:247-52, December 1957.

62) Weir, Sister Mary Edith. Development of the Listening Skills in the English Program of the Primary Grades. Master's thesis. Cleveland, Ohio: St. John College, 1957.

63) Welsh, George B. An Investigation of Some Predictive Factors in Auding Ability. Doctoral Dissertation. Pittsburgh, Pa.: University of Pittsburgh, 1954. Abstract: Dissertation Abstracts 14:2407-08, 1954 and Speech Monographs 22:153, June 1955.

64) Wilt, Miriam E. "Let's Teach Listening." Creative Ways of Teaching the Language Arts. Leaflet 4. Champaign, Ill.: National Council of Teachers of English, 1957.

The first step in teaching listening is for the teacher to examine her own listening habits. "Children learn best those things they live and do; they learn from each other. They cannot learn how to speak by listening entirely to the teacher speak, nor can they learn to listen to their peers when they seldom have the opportunity to listen to their peers." A number of activities useful in teaching listening are listed.

65) ----. "Listening Skills Can Be Improved." Instructor 72(5):6+, January 1963.

Although children listen when they first come to school, they do not do so objectively, appreciatively, or critically. To teach them to do so is the task of the school. That to which the child is asked to listen in school should be worthy of time and thought. Without pre- and post-discussion, listening skills will not improve by the mere act of listening.

66) ----. "Speaking and Listening in the Elementary School." Pennsylvania University Schoolmen's Week Proceedings, 1951:132-38.

A particularly harmful classroom practice is that of having children listen to material being read aloud that they have already read silently.

67) ----. A Study of Teacher Awareness of Listening as a Factor in Elementary Education. Doctoral dissertation. State College, Pa.: Pennsylvania State College, 1949. Abstract: Abstracts of Doctoral Dissertations, Pennsylvania State College, 1949. Summary: Journal of Educational Research 43:626-36, April 1950, and The Teaching of Listening and Why Monograph on Language Arts, No. 66. New York: Row-Peterson, 1951.

In answer to a questionnaire teachers estimated that elementary pupils spent 77 minutes per day in listening. Observations in 18 classrooms showed that children were expected to listen an average of 158 minutes a day. Of this time 54 per cent was spent in listening to the teacher. In response to the questionnaire 61 per cent of the teachers rated reading as the most important language art skill; 16 per cent ranked listening as the most important.

68) Witty, Paul A. and Sizemore, Robert A. "Studies in Listening." Elementary English 35:538-52, December 1958, 36:59-70, January 1959. 36:130-40, February 1959, 36:297-301, May 1959.

Most of the above annotations were taken from Duker's Listening Bibliography.

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THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

Mathematics*

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Early Educational Stimulation in Mathematics

The Project

A Problem Specification Project in mathematics was formed in September of 1965 and sponsored by the Research and Development Center of the University of Georgia. The primary objective of the project is to identify research areas in early mathematical stimulation of children, ages 3 through 12. To accomplish this objective the project group* is reviewing and summarizing research findings published during the last decade - a period of rapid change in mathematics education.

The project group began by searching the following reference materials:

Dissertation Abstracts
Education Index
Journal of Research in Science Teaching
Psychological Abstracts
Review of Educational Research
United States Government Publications

Because of the special nature of the journal, all issues of The Arithmetic Teacher were reviewed. Also, the bibliographies of several textbooks on the teaching of mathematics were searched for references which might provide additional information.

Currently, the project is well underway, but by no means complete. Approximately six hundred articles have been reviewed and abstracted, and the project group is compiling an annotated bibliography. Several references, particularly masters' theses, are not available in the University of Georgia library. During the next few months efforts will be directed toward securing and abstracting copies of missing references, refining the format of the bibliography, cross-referencing studies, and indexing the final report.

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Although the project is incomplete, an interim report now appears worthwhile. Much has been learned from the study of research in mathematics education for young children. The purpose of this report is to indicate some of these research results in early educational stimulation and to specify a few implications and issues which might be of interest to teacher educators.

Outline of the Bibliography

An important task in constructing the bibliography is to select a format which will be functional. One aim is to choose descriptive titles for each section and subsection to permit researchers to locate pertinent information rapidly. A second aim is to reduce the number of cross-references to help researchers avoid the necessity of referring to several sections. Thus, the section headings should be broad enough to cover the entire field of investigation but at the same time reduce the overlap between sections.

The current outline of the bibliography is listed below:

Outline of A Bibliography of Research Studies
In Elementary School and Pre-School Mathematics

I. Students
    A. Status of Achievement
    B. Grouping for Instruction
    C. Attitudes
    D. Environment
II. Teachers
    A. Training
    B. Status of Achievement
    C. Attitudes

III. Content
   - A. Program Evaluation or Comparison
   - B. Feasibility Studies
   - C. Appropriateness Studies

IV. Methods and Materials
   - A. The Instructional Period
   - B. Homework
   - C. Instructional Aids
   - D. Methodology

V. Philosophy

VI. Evaluation

VII. Bibliographies and Reviews of Research

A danger in selecting headings for a bibliography of this kind is that the particular selection and arrangement may bias the whole reference. For example, in the outline reported above it may not be apparent that there are any studies dealing with discovery. Actually, a subsection of Methodology is devoted to this topic, and other sections may well be related to the use of discovery techniques - e.g., Status of Student Achievement, Philosophy, or Grouping for Instruction. Of course, it is the bibliographers' responsibility to cross-index topics. Suggestions to the project group about rearranging the headings or including other topics will be appreciated.

Selected Research Review

The remainder of this talk will be a summary of research results reported in selected subsections which leads to a discussion of needed research. This summary and discussion focus around the conference theme - "Implications of Early Educational Stimulation for Teacher Education."

Student Status (I.A.)

Several studies have been conducted to determine young children's understanding of mathematical concepts or degree of skill. Pre-school, kindergarten, and first grade children have been found to be familiar with cardinal and ordinal number concepts [I.A.: 101,102,103,105,106,111,115,203,209,214.]* and to have simple measurement skills [I.A.: 104,112,210]. Although achievement levels differed appreciably among students entering kindergarten, about one-third were ready for organized sequential work, and almost all students were more proficient at the end of the school year, even in the absence of formal instruction in mathematics [I.A.: 104,105]. Researchers found that mathematical abilities for these young children were significantly related to mental age, socioeconomic level, and sex [I.A.: 101,109,115,210], however, one investigation found differences in achievement between sexes not significant when factors of mental maturity and socioeconomic status were controlled [I.A. 115].

As one would anticipate, children in higher grades have higher levels of achievement. Time does not permit a thorough discussion of specific abilities, however, from 3 to 8 studies at each grade level from second through seventh report these abilities and their relationship to other varibles.

Program Evaluation and Comparison (III.A.)

The status of the elementary mathematics program in the United States is characterized by the following attributes as determined by extant research and opinion.

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*Symbols in brackets[] designate the section, subsection, and number of references in the bibliography.

There is some evidence that present programs are better than the past ones [III.A. 224] though the similarities are much more prevalent than the dissimilarities [III.A.: 208,214]. Also, it has been found that modern programs of mathematics are at least as good as present "traditional" programs and often better [III.A.: 209,210,212,216,217,219,220,221]. One report favored traditional over experimental on traditional tests [III.A. 222].

Textbook programs in this country appear about average when compared with those in Europe [III.A. 506] though some reports have claimed superiority for other countries [III.A.: 505,511], and at least one has claimed superiority for Iowa schools [III.A. 515].

European schools are more likely to start earlier and be more experimental [III.A.: 502,513]. For example, the geometry of the Greek fifth and sixth year compares favorably with tenth grade here [III.A. 510].

American students are apparently behind European children as much as two years [III.A. 511], and, in particular, behind the English [III.A.: 501,503, 516,517]. Dutch students also appear ahead, though they start to school earlier [III.A. 507]. At least one study [III.A. 508] gives one American school system favorable comparison with English and Canadian schools. The primary issue is: if textbooks are similar, what is the cause of American students being inferior? Should our students simply start school earlier?

Textbook analyses have revealed much agreement as to topic sequence [III.A.: 401,402,410] though there is evidence that the reading level of materials is generally above the grade level at which they are used [III.A.: 408,409]. There is also apparent difficulty in the appropriateness of vocabulary [III.A.: 407, 411] though one study differed in this matter [III.A. 406]. There is evidence, happily, that publishers utilize within five years research which is clear and concise [III.A.: 403,404].

A major area of content research has been in the area of problem-solving. Some studies have attempted to determine variables associated with problem-solving ability [III.A.: 303,310,311] while others have sought means for improving this ability [III.A.: 308,312,315,317].

Feasibility Studies (III.B.)

The feasibility studies have shown that students can learn much more mathematics than educators anticipated a decade ago. For example, first graders have learned simple set notation [III.B. 106], and second graders learned to read and write numerals in base five [III.B. 103], do systematic work with fractions [III.B. 102], and succeed in the Hawley-Suppes geometry program [III.B. 101]. This last named program has been tested in grades 1 through 5 and appears to be best suited to grade 4 [III.B.: 204,208,302]. Other studies with impressive results have shown that fourth graders can have some success in dealing with modular arithmetic [III.B. 205] and understanding the meaning of median, mean, and mode although few were able to compute these statistics [III.B. 201].

Also, fifth and sixth grade students were able to learn a considerable amount of algebra [III.B. 306], geometry and point set topology [III.B. 301], and logic [III.B. 305]; logic was learned by upper quartile fifth and sixth graders at nearly the same level and in the same time as college juniors and seniors [III.B. 305]. Children may arrive at the optimum age for learning logic at 10 to 12 years [III.B. 304].

Appropriateness Studies (III.C.)

Research concerning what content should be included in the study of mathematics is almost void. The generalization that young children can learn more mathematics than previously anticipated is a simple observation based on research reviewed in earlier sections. However, questions naturally arise about what should be taught and for what educational advantage.

Reported results of appropriateness studies have random and diverse implications. Kindergarten students make daily use of the ideas presented in a planned program of arithmetic instruction and appear to be ready for such a program [III.C. 01]. Also, it has been found that the introduction of bases other than ten in fourth grade led to increased understanding of base ten, and teachers reported an increase in interest and a decrease of confusion in their students [III.C. 06]. One study indicated that the use of decimal rather than common fractions in fifth grade increased speed and accuracy in computations [III.C. 08]. Another study reported that the inclusion of a unit on modular arithmetic did not significantly improve students' understanding of the decimal numeration system [III.C. 10].

Many authors recommend that new topics be incorporated in elementary school mathematics - such as geometry [III.C.: 02,14,16] and mental arithmetic [III.C. 09]. However, there is an outstanding absence of longitudinal studies to determine the effect on the whole mathematical program of early inclusion of specific topics.

One difficulty in determining the appropriateness, or relative value, of a particular topic is the variety of objectives which the elementary arithmetic program must be designed to accomplish. For example, while the study of modular systems does not seem to increase students' understanding of decimal numeration [III.C. 10], it may, as an example of a mathematical system, help students to better understand the spirit of modern mathematics. Further research in the analysis of the objectives of instruction, including their reduction to behavioral terms, may serve to facilitate the determination of topics appropriate to the elementary school.

Methodology (IV.D.)

Some very startling results were found in reviewing research in methods of instruction-notably the absence of research in certain important areas.

On the positive side, it can be asserted that teaching children meanings has a decided payoff, particularly in basic understanding, ability, and retention of mathematics [IV.D.: 609,628,640].

More discouraging is the fact that, although many studies are included under methodology, most investigations are about a particular method used for a selected topic and grade level. In particular, it is regrettable that little or no research has been conducted concerning methods of teaching mathematics to pre-school, kindergarten, first grade and second grade children. Nine methodology studies were found for second and third grades, sixteen for fourth and fifth grades and twenty-five for sixth and seventh grades - but only one for the beginning grades. The study for beginning grades concerned procedures for teaching geometry in kindergarten [IV.D. 103]. Of the nine methodology studies in second and third grades, 3 concerned teaching subtraction, 3 multiplication, 2 division, and 1 classroom climate. In view of the results reported in previous sections about the feasibility of teaching young children mathematics, it would appear that research about how effective instruction can best be achieved would be a prime area for investigation.

Teachers' Knowledge of Mathematics (II.B.)

Several studies reveal, almost universally, that elementary school teachers are not well-enough prepared to teach mathematics. General evidence is cited by many authors [II.B.: 112,117,204,206,303].

One investigation found prospective elementary teachers' understandings of mathematics to be at the 7th and 8th grade level [II.B. 101] while another rated 80% of them above the 9th grade level [II.B. 104], but still a third placed them beyond the 12th grade level [II.B. 111]. Specific weaknesses have been found in the backgrounds of 1963 graduates and recommendations were made for content and methods courses in teacher preparation [II.B. 109]. Also, teachers and prospective teachers have been found to be more accurate than 5th and 6th grade students in making estimations of quanity, but they still had gross errors in the order of 60% [II.B. 103].

Three studies stated that the amount of mathematics training was positively related to mathematical understandings [II.B.: 105,108,115]. Although teacher-education students were not generally different from other students in college admission requirements, the education students were found to be mathematically less competent at the end of the college program [II.B. 116].

To overcome weak mathematical backgrounds of teachers, two studies reported favorably on the use of a methods course [II.B.: 102,106], but two others found no significant differences related to completion of a methods course [II.B.: 111,118]. A course in functional and remedial mathematics significantly aided prospective elementary teachers' understanding of mathematics [II.A. 118], and a lower division mathematics course significantly helped another group [II.B. 107].

Pupil gain has been shown to be associated with teacher understandings [II.B. 402], number of courses in mathematics of the teacher [II.B.403], number of years of teaching experience [II.A. 312], and teacher attitude [II.B. 403]. However, one study found no relationship of teacher attitude to pupil gain [II.B. 402].

Summary

In the limited time available for this topic, an attempt has been made to report how the problem specification project has been organized and its present status. Although we are still in the process of searching out studies and catagorizing them, many issues are already emerging.

It has been demonstrated that children who are at least five years old are ready to begin the study of mathematics. In fact, many of them learn beginning notions without the aid of a planned program. Older children, also, are capable of learning mathematics which was assumed to be too difficult for them several years ago. Currently, studies are needed to determine _what_ mathematics should be taught, _how_ it should be taught, and _why_ it should be taught. In particular, appropriateness studies and methodology studies, which are broad in scope, of the longitudinal type are needed. In the methodology studies, it might be suggested that a classroom observational tool like Flanders' Interaction Analysis would be useful to identify classroom operational procedures and determine how they relate to student achievement.

Also, it is noted that few studies have been coordinated to permit comparisons with other research findings. For example, broad studies of student achievement over a number of years would provide, via trend analysis techniques, predictions of expected increases in base-line understandings. Perhaps, reports of the effectiveness of programs such as SMSG, which should be forthcoming, will provide some of this information.

Several studies have shown that elementary school teachers were not in the past, and are not currently, adequately prepared to teach mathematics. As new programs are shown to be more effective, it may be safely assumed that there will be increasing pressure to provide better mathematics training for these teachers - both in-service and pre-service.

Finally, those of us who have had an opportunity to work on the bibliography feel that the finished product will provide educators interested in early mathematics stimulation with a useful source of information.

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THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

PHYSICAL EDUCATION*

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REVIEW

Virginia Musselman (18), in the April, 1960 issue of The Instructor, made the following statements: "Children are by nature action-oriented but all too often, in the machine age, they have little opportunity for strenuous activities. Just playing games is not enough. It's how they are played, when they are played, that is important. The children play for fun, the teacher has a purpose. Above all, the teacher should show an interest in skills, encourage the youngsters to improve at their own rate, see that every child, not just the ones to whom skills come easily, gets a chance; praise them, challenge them, give them a chance to let off steam."

Karl and Carolyn Bookwalter (3) have stated: "...organic development is basic and indispensable to the attainment of skills, related judgments, and wholesome attitudes. Furthermore, bodily skill development has been shown recently to be basic to normal intellectual development. These developments are frequently neglected or taken for granted by curriculum builders. Many of our country's presidents, on the other hand, have appealed to educators to make a more adequate provision for this essential goal."

Anna Expenschade (4), writing in The National Elementary Principal, stated, "Activity and multiple stimulation, both intrinsic and extrinsic, are now recognized by psychologists as vital factors for both physical and psychological maturation. Studies of interest, attitudes, and personal and social adjustments have implications for all aspects of the elementary school program, including physical education."

The purpose of a study by Vitalone (29) was to determine the effect of a program of movement experiences on certain behavior traits and the performance of certain physical skills of a selected group of first grade children. Two rating scales were constructed so that behavior traits and the performance of physical skills could be recorded. After the instruction in the use of the rating scales, the teachers of the control and study groups rated the children in October. Upon completion of the program of movement experiences for the study group, both groups of children were rated again in June. The program of movement experiences consisted of twenty-four weekly class sessions. The data from the October and June ratings were treated and the study and control groups compared. A Behavioral Direction score was devised to study overall behavior of individual children. The study clearly demonstrated the need for movement experiences for young children and the relationship of movement to behavioral changes in children. The procedures used in the in-service education of teachers involved in this project also pointed to the importance of conceiving of other ways of helping teachers improve their work.

Mary V. Alexander (1) conducted a study to determine whether any relationship existed between minimum muscular fitness and adjustment of children in the fourth, fifth, and sixth grades. Various tests were used to determine the fitness level and the extent of well-being or non-well-being. Her first hypothesis was that of the group of children classified as well-adjusted, more of them would be muscularly fit than of those classified as non-well-adjusted. Based on the data collected, this hypothesis was accepted. A second hypothesis stated that there would be fewer incidences of failure of the muscular fitness tests in the well-adjusted group than would be found in the non-well-adjusted group. This hypothesis was also accepted. The final hypothesis was that more of the children in the city schools, where physical education was taught by a special teacher, would perform better on the muscular fitness tests and be better adjusted than those children taught in the rural schools, where physical education was taught by the classroom teacher. Adjustment and fitness did not show to be more characteristic of one group than the other and this hypothesis was rejected.

Doris Hutchinson (13) explored why various factors entered into the self image the individual child perceived and how these factors might have the desirable effect. She concluded that setting guide lines for children and permitting them to achieve individual goals tended to increase one's self-concept. The appeal of a simple somerssult may elicit the same response from one child as hitting a home run may do for another child. She stated that it was important to recognize the role of having a good self-concept prior to achieving a good role in the development of socialization. The author felt that guided and well-planned physical education programs would alter the self-concept role and make all other tasks much easier for the student.

Fraleigh (8) investigated the influence of play upon social and emotional adjustment and its implications for physical education. Among his conclusions were the following statements:

(1) Play is potentially very therapeutic and can help maladjusted children attain more desirable social and emotional adjustment.

(2) The presence of an understanding and accepting adult will significantly increase the ability of play activities to contribute to the

therapy of maladjusted children.

(3) The type of play materials and opportunities arrayed for children's use seems to have significant influence on the therapeutic potential of play.

(4) A relationship exists between the skill, achievement, and participation of children and growth in the normal pattern of physical and recreational play activities and the measured level of desirable social and emotional adjustments which they will exhibit.

(5) Changes in social and emotional adjustment of children and adults have accompanied experiences in play and recreation.

(6) The type of play experiences engaged in has great influence on whether the social and emotional effects of play are relatively desirable or undesirable.

Merriman (16), in a study in the relationship of personality traits to motor ability, found that the upper motor-ability group of subjects scored significantly higher than the lower motor-ability on the measures of poise, ascendancy, and self-assurance and on the measures of intellectual and interest modes. The correlation coefficients were too small to be of value in predicting that subjects who score high in motor ability would score high on the personality traits or that subjects who score low in motor ability would score low on the personality traits. In so far as personality measures may be taken to indicate levels of adjustment, persons who were high in motor ability tended to be better adjusted than persons who were low in motor ability. The results of the study indicated that motor ability is related to personality traits.

In an investigation by Hunt (12) of the bearing of muscular fitness upon the classroom effectiveness of elementary school children, it was found that when muscular fitness and classroom effectiveness were correlated at the beginning and at the end of the experimental period, a trend toward a positive relationship was found. On the classroom effectiveness rating scale, the experimental groups showed a statistically significant greater mean change than did the control groups. There was no statistically significant change in the Ohio Recognition Scale. The findings of the study were not conclusive; however, the evidence seemed to indicate that some relationship existed between muscular fitness and classroom effectiveness.

Whittle (32), after studying the effects of elementary school physical education upon aspects of physical, motor, and personality development, stated that "the conclusion seems justified that boys who participate a lot in extraclass physical activities are superior in the affective elements listed to those who participate a little in such activites. Conclusions, however, as to whether the participation produces the superior boys or whether these boys participate in outside activities because they are superior or whether the cause is a combination of these two, are not possible from this study."

Ann Sprague sought to determine the relationships between selected measures of expressive language and motor skills, and between these and certain physical, intelligence, and socio-economic measures in eight year old boys. In general the measures of expressive language and motor skills studied in this investigation were not significantly related. Intelligence and socio-economic status had no apparent relationship to the performance of gross motor skills but were positively related to fine motor coordinations.

In a study of first grade Caucasian pupils drawn from all socio-economic levels, it was found that failing students tended to be more immature on a battery of anthropometric indices than successful students. It was concluded that anthropometric measures may help to identify immature pupils who may have trouble keeping up with the group (33).

Ririch (21), as reported in Theory in Practice, stated: "The effectiveness of school physical education in promoting the physical growth of children has not been clearly established. Longitudinal studies in which the exercise variable and other related factors can be effectively controlled are, for the most part, not feasible. However, limited observations in this country and abroad indicate that daily programs of vigorous physical education can result in measurable changes in girth and breadth beyond those attributable to normal growth. But no effect is noticeable on linear growth, either in height or limb length. The exact intensity and duration of exercise necessary to produce augmented growth is not known, nor even whether such growth is in the best interest of the child. Nevertheless, it is clear that the growing child needs ample opportunity for unrestricted activity if normal growth is to occur. The amount of time required varies with the age and constitution of the child. ...In any case, the drive for physical activity is sufficiently strong that most normal healthy children will satisfy it if undue restrictions are not imposed on them or if their natural desire for physical activity is not destroyed by the distractions of our sedentary society."

Whaley (30) studied the relationships of the growth of the child as a whole during the elementary school period to high school achievement and activity participation. It was found that rate of growth of the child as a whole was significantly related to high school achievement of both boys and girls, and that fast growers received significantly higher grades than slow growers. It was possible to predict certain high school experiences of children on the basis of their earlier development. A topological analysis of longitudinal developmental data promises to provide a better understanding of the intricate relationships between organismic growth patterns and behavior.

In a study of the relationship between performance in selected motor skills and mental achievement of children of elementary school age, only 20% of the eighty intercorrelations obtained were of statistical significance - or there was little evidence of a marked relationship between motor performance and mental achievement. It was stated, however, that this low degree of relationship might have been in part influenced by the test conditions encountered and/or the low reliability of certain of the motor tests (28).

Hart and Shay (10) investigated the relationship between physical fitness and academic success. While this study was conducted with older subjects, it has implications for the elementary age child. The conclusion was that although physical fitness is not a general predictor of academic success, the relationship was high enough to be considered as a necessary factor for the improvement of academic grades in general education.

Olsen (19) concluded from his study of "outstanding" fifteen year old boys that boys with outstanding or poor scholastic accomplishments do not differ from other boys in physical measures.

Several other studies substantiate the evidence that increased motor skills may be evidence of higher academic achievement. Twenty-five years ago Lewis Terman stated that physical weakness was found nearly 30% fewer times in children of higher intelligence than in those of lower intelligence. Raric and McKee studied twenty third-graders grouped according to low and high motor efficiency. The higher motor efficiency group had a greater number of excellent or good academic ratings. Keogh and Benson experimented with forty-three underachieving boys aged ten to fourteen. They found that half the boys exhibited poor motor performance. Clarke and Jarman studied nine, twelve, and fifteen year old boys and found a consistent tendency for the high groups on various strength and growth measures to have higher means on both academic achievement tests and grade point averages than the low group. Norman, in research on educationally subnormal boys in England, found that systematic and progressive physical conditioning yielded marked mental and physical improvement. He concluded that such improvement resulted from the boys' feelings of achievement and of consequent improved adjustment.

Bauer (2) conducted a study to determine the correlation between motor capacity and mental capacity and between motor achievement and mental achievement and also to determine the possible significance of environmental and parental factors as they related to motor and mental achievement. Neither motor capacity and mental capacity, nor motor achievement and mental achievement were significantly correlated. The level of education of the parents seemed to be a very important factor in the motor and mental achievement of these children. Boys of high motor achievement usually were the boys who had a definite preference and interest in the area of sports. One of the most important factors in the achievement of boys and girls was the interest displayed by the parents in the activities, hobbies, and interests of the children.

Ismail, Kephart, and Cowell (14) have studied the use of motor aptitude tests in predicting academic achievement in elementary school subjects. They started with 39 variables and extracted seven factors which were given names and further studied. They observed the variances associated with the regression equations developed and concluded that the motor test batteries were adequate for predicting I.Q. scores, Stanford Achievement scores, and academic achievement scores. Balance and coordination items were the best predictors for estimating achievement.

Barbara Godfrey (9) observed the effects of a special program of gross motor activities designed as therapy to facilitate academic school achievement among children having academic achievement problems even though of normal or higher intelligence. The scholastic achievement tests scores for all participants increased while psychological and I.Q. test scores showed little change. School grades improved in the majority of subjects by one letter grade, several by two. None of the matched, non-participating cases showed comparable results or improvement. For the non-participating cases scholastic achievement test scores, I.Q. test scores, and classroom grades either remained the same or showed a decline. The small sample used in the study prevented the statement of solid conclusions, but the enthusiastic support of parents, teachers, and principals involved, as well as the scholastic improvement obtained in the participants, but not in the non-participants, led to the belief that the motor therapy program was a definite contributing factor.

In studying the grade placement of games in the elementary school curriculum of physical education, Morris (17) found that the hypothesis that children at each grade level are able to perform movement skills required for successful participation in a more advanced grade was supported. She also confirmed the hypothesis that children at each grade level were able to utilize their movement skills effectively in the more complex situations presented by advanced games. The hypothesis that children at each grade level find satisfaction in playing games traditionally assigned to the next two higher grade levels was also supported, even though some children found their greatest satisfaction in games traditionally assigned to their present grade level. She concluded that there is a need to restudy the traditional grade placement of specific games within the curricula of physical education in the elementary schools with a view to introducing more complex game situations at earlier grade levels.

Howard (11) compared two methods of teaching ball handling skills to third grade students - the control method representing the traditional approach of explanation-demonstration and the experimental method consisting largely of problem-solving techniques. The results were not conclusively in favor of either method when skill performance was the only measuring tool.

Only two studies are cited here in the area of teaching physical education in the elementary school by the specialist versus the classroom teacher. Fitzpatrick (7) concluded that special physical education teachers provide a higher quality program than classroom teachers. Ross (22) suggested that girls taught by the specialist were supreior in performance to girls taught by the nonspecialist, while boys taught by the nonspecialist were superior in performance to boys taught by the specialist. In a previously cited study by Alexander, it was concluded that performance on muscular fitness tests and adjustment were not significantly different when groups were taught by the specialist and the classroom teacher.

Several studies have been completed on the merits of various systems or methods of developing physical fitness in elementary age students. White (31) compared the basic skill method and the calisthenic method in development of physical fitness and motor skill. The basic skill group made a significant gain over the calisthenic group in six of the seven items of motor skill. The basic skill group was also superior in the physical fitness tests.

Stanley (26) compared the effects of exercise and developmental activities, exercise and games, and games only, on physical fitness of elementary school children. For the various tests items in the AAHPER Youth Fitness Test, each of the programs or methods caused significantly different increases. No conclusions were drawn to indicate one program was superior for all the test items.

Falvicius (6) found that adding five or six calisthenic exercises to the regular elementary school physical education program brought about significant benefits in the development of fitness and improved skill.

These calisthenics took about three minutes of each lesson or slightly more than 10% of the total class time.

Logsdon (15) found that the vigorous activity provided through the practice of basic skills increased the level of physical fitness at a rate comparable to the increase induced by vigorous calisthenic exercises while at the same time increasing significantly the ability to perform the tests of basic skills. The data seemed to indicate rather conclusively that the advocation of a vigorous calisthenic program for fourth and fifth grade girls could be superceded by the practice of basic skills for the purpose of developing physical fitness, since the program emphasizing basic skills proved to be as effective as the calisthenics program in augmenting physical fitness.

Strong (27) investigated the effect of six motivating conditions on the performance of physical fitness tests. Of the motivating devices utilized, the use of the level-of-aspiration, team competition, and competition against self-motivating conditions resulted in greater mean gains than the other conditions - those other conditions being competition to establish class records, competition against someone of nearly equal ability, and competition against someone of markedly different ability. Motivation improved boys' performances more than girls' performances. It was concluded that the validity of measures of physical fitness was dependent upon the motivating conditions under which the tests were administered.

Price (20) investigated the relationship between the level of aspiration and the performance in selected motor tasks. Within the limits of the study, it was concluded that a positive direction of level of aspiration's effect on performance did exist. The subjects' scores for separate tasks indicated a significant relationship between what an individual "tried" to achieve and his actual achievement. What determined the level of aspiration and its consequent effect on performance was not ascertained.

Competitive athletics for the elementary school child has been much discussed and some research has been done. Shaffer (24) concluded that competitive athletics for elementary school youth was important to their physical and social development. When athletic program supervisors rigidly observed the standards set forth by medical and educational authorities, the end result was good for the child and risks to his physical and mental well-being were negligible.

Scott (23) conducted a study to determine the attitudes of parents, teachers, and administrators toward intensive competition in team games at the elementary level. Parents were more favorable toward intense competition in elementary physical education. Homeroom teachers were next in order of preference toward this type endeavor and administrators were lowest in rank of positive correlation of favorable attitudes and competitive sports. Experience in athletics as a child or adult favorably disposed the individuals' attitudes toward competitive sports. Results obtained from the respondents did not imply a general favorable attitude existed toward elementary sports.

In conclusion, Espenshade (5) stated, "the deterioration of various body systems begins when regular exercise is discontinued or neglected. The reason a child develops so rapidly is the encouragement he receives for performing the movement. It is an intrinsic desire of a child to move about freely and this movement is complementary to the mental growth he experiences or realizes. Discontinuation of physical exercise is an acquired phenomenon learned from parents, socio-economic environment, etc. To permit the child to develop to the greatest extent involves the encouragement and development of the natural phenomenon to which the child originally intrinsically turned in early infancy."

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THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

EARLY READING AND RELATED READINESS*

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Allen, Ruth J.; Gilfax, Sarah R.; Halleran, John F.; Herrick, Virginia L.; Levis, Myrna A.; Marston, Marilyn; Northridge, Nancy L.; Pappas, Vasilike; and Wood, Virginia S. The Relationship of Readiness Factors to First-Grade Reading Achievement, Unpublished M.Ed. Thesis, Boston University, 1959. (1)

A study to measure various factors contributing to reading achievement. Reading achievement in January in Grade One seems more closely related to knowledge of letter names and sounds than to abilities taught in readiness workbooks of basal series. Chronological age does not appear to be an important factor in first-grade success.

Alsup, Robert F. A Study of the Procedures Used and the Problems Encountered in Promoting Growth in Initial Reading, Unpublished Ed.D. Thesis, University of Missouri, 1955. (1)

To determine procedures first-grade teachers use and problems they encounter in promoting growth for initial reading.

Anderson, Irving H., and Hughes, Byron O. "The Relationship Between Learning To Read and Growth as a Whole," School of Education Bulletin, University of Michigan, February 1955. (1)

To compare physical growth of two groups of first-grade boys, whose IQ's were all nearly the same, but whose age of learning to read differed widely.

Boys who begin reading late tend to be physically less mature than boys who begin reading early.

Anderson, Irving H., Hughes, Byron O., and Dixon, W. Robert. "Age of Learning to Read and Its Relation to Sex, Intelligence, and Reading Achievement in the Sixth Grade," Journal of Educational Research, XLIX (Feb. 1956) 447-53. (2)

This study provides substantial evidence that a child's readiness to read depends upon more factors than simply those measuring his chronological and mental ages. A conclusion of the report was that the age of learning to read has only a slight relationship with later reading progress.

Barrett, Thomas C., "Visual Discrimination Tasks as Predicators of First Grade Reading Achievement," The Reading Teacher, January 1965, Vol. 18, No. 4, pp. 276-282. (2)

To determine the ability of 9 reading readiness factors (7 of which require varying degrees of visual discrimination) to predict reading achievement. Reading letters and numbers was the best single predictor of first grade reading achievement; other factors not included played a strong influence - such as home environment, experience with letters and numbers, etc. The use of geometric figures and pictures had strength as a predictor.

Bevington, W.G., "Effects of Age at Time of Entrance into Grade I on Subsequent Achievement," Alberta Journal of Educational Research, 4 (Mar. 1958), 6-16. (2)

Bevington, in a Canadian study, concluded that mental age was more significant than chronological age in assuring success in beginning reading, but he defended the common practice of using both factors in deciding upon school entrance.

Blakely, W. Paul, and Shadle, Erma M., "A Study of Two Readiness-for-Reading Programs in Kindergarten," Elementary English, 38: 502-505, November, 1961. (1)

To determine whether a kindergarten child shows more readiness and potential for reading after using readiness books of a basal reader program or after an activity program of experiences.

In boys, experience-activity approach at the kindergarten level results in significantly greater readiness to read. In girls, readiness to read develops with equal efficiency under basal reader or experience approach.

Bradley, Beatrice. "An Experimental Study of the Readiness Approach to Reading," Elementary School Journal, 56: 262-267, February 1956. (1)

To determine whether children profit if formal instruction in reading is withheld until they are ready.

By end of third year, experimental group was up to grade standard in reading and continued to equal progress of control group.

Bruce, D. J., "The Analysis of Word Sounds by Young Children," British Journal of Edu. Psychology, 34 (June 1964), 158-69, p. 367, para. article (31).

To examine the ability shown by children at different levels of mental development for the task of making a single phonetic analysis of spoken words.

Study suggests that there is a gradual progression towards accurate phonetic analysis. Mental age 7+ is indicated as the level at which requirements become available in sufficient degree to permit some success.

Brunner, Catherine, "Project Help", Educational Digest, 29: 22-5 (Mar. 1964)

To describe Baltimore City's "Early School Admissions Project" - initiated in 1962 and scheduled to operate through 64-65 school year. Considered highly satisfactory by the author.

Brzeinski, Joseph E., "Beginning Reading in Denver," The Reading Teacher, Vol. 18, No. 1, October, 1964, pp. 16-21.

To review the longitudinal research study to determine the effectiveness of beginning the teaching of reading in kindergarten.

At the end of first year, the pilot program of systematic instruction in beginning reading skills appeared more effective than the regular program.

Brzeinski, Joseph E. "Reading in the Kindergarten, " *Teaching Young Children to Read* (edited by Warren G. Cutts), pp. 50-58. Conference Proceedings of the U. S. Department of Health, Education, and Welfare, Office of Education. Washington: U. S. Government Printing Office, 1964. (2)

A study comparing first grade reading achievement of children receiving kindergarten reading instruction with children following regular kindergarten program.

Children who received kindergarten training scored significantly higher on reading test in first grade.

Burwen, Barbara R.; Culliton, Thomas E., Jr.; Matheson, Lois A.; Vinagra, John. *An Analysis of the Relationship of School Entrance Age to Mental Age and School Achievement in Grades One, Three, Five, and Eight*, Unpublished Ed. M. Thesis, Boston University, 1958. (1)

Study concerning relationship of school achievement to chronological age at time of entrance into grade one.

There were no statistically significant differences between age group comparisons in reading, arithmetic, language, and spelling.

Carroll, Marian L., "Academic Achievement and Adjustment of Underage and Overage Third Graders", *J. Ed. Res.*, 56: 415-19, (Apr.'63)

To obtain further evidence as to possible disadvantages encountered by children who enter first grade chronologically behind the majority of their classmates.

The findings tend to give the overage children the more favorable advantage.

Clymer, Theodore. "Does 'Can' Mean 'Should'?" *The Reading Teacher* January 1963.

Clymer states that children in the kindergarten *can* learn to read, but the question remains as to whether they should read.

He stresses need of further studies that seek later benefits from early instruction.

Della-Piana, Gabriel, "Teaching Beginning Reading in Other Countries," Elementary English, (March, 1964), p. 251.

(A) Some observations on a few selected research studies in Sweden, England, Scotland, and Puerto Rico; (B) to look at teaching of reading in Iran; (c) and motivation learning in the USSR.

Diack, H. Reading and Psychology of Perception. Nottingham (England): Peter Skinner, 1960. (2)

Concerning reading readiness Diack, an English investigator, discusses the prolonged period of reading readiness in American schools. He states that, in America particularly, the actual teaching of reading has been so much delayed that many a child, instead of getting ready to read, gets bored with waiting to be taught.

Dickinson, Donald C., and Lisson, J. Donald, "The Effects of Chronological Age in Months on School Achievement," Journal of Educational Research 56: 492-3.

To determine the effects of chronological age (CA) at the time of entering school on later school achievement. Older children scored higher than younger children although younger children had higher IQ's. (Iowa Test of Basic Skills)

Dixon, W. Robert. "The Relationship Between Reading Achievement and the Method of Teaching Reading," School of Education Bulletin, University of Michigan, April 1956. (1)

Study comparing effects of differing readiness programs upon reading achievement; one school intorudced children to reading on an individual basis with child advancing according to rate of growth, while a second school developed readiness through format group instruction.

Informal practice appeared to delay age of beginning reading, but did not affect ultimate reading achievement.

Dolch, Edward W., and Bloomster, M., "Phonic Readiness." Elementary School Journal, XXXVIII (Nov. 1937), pp. 201-05. (2)

This writing suggests that children do not begin to profit from an analytic approach to reading before they have acquired a mental age of approximately seven years.

Durkin, Delores, "A Fifth Year Report on the Achievement of Early Readers," Elem. Sch. J., 65:76-80 (Nov. '64).

To describe the achievement of pre-school readers five years after they entered first grade. Author finds that pre-school help with reading does not lead to problems for school instruction in reading, that for some children earlier reading leads to greater achievement in later years and that a majority of "bright" preschool readers achieve higher after 5 years of school than non-early readers after 6 years of school.

Durkin, Delores, "An Earlier Start in Reading?" The Elementary School Journal, Vol. 63 (December 1962) pp. 147-151.

"A report on one part of a longitudinal study of children who could read when they entered first grade."

Comparison of scores of control and experimental groups with IQ's of 120 or less--indicate two observations. (1) They appear to have profited from early start; (2) the lower the child's IQ, the greater seems advantage of beginning early.

Durkin, Delores. "Children Who Learned to Read at Home," Elementary School Journal, 62:15-18, October 1961. (1)

To determine what accounts for preschool ability in reading and what the value is of learning to read early.

Factors contributing were found to be attitudes of parents and older siblings in family. At the end of second year of school, group that received help at three years of age still showed greater achievement, but the lead was reduced by 4 months.

Durkin, Delores. "Children Who Read Before Grade One," The Reading Teacher, January, 1961.

In a study involving 49 children who learned to read prior to grade one, Durkin concluded that many factors, other than those specific skills measured by I.Q. tests and readiness tests, affect the ability of a child to read at an early age.

Some of the factors listed as significant are: socio-economic status of the family, high family regard for reading, older brothers and sisters who read to the child, and willingness of parents to answer the child's questions about words.

Durkin, Delores. "Children Who Read before Grade 1: A Second Study", Elementary School Journal, 44 (Dec. 1963), 143-48. (2)

A study comparing backgrounds of entering first grade children who had learned to read at home with non-reading children.

In parent interviews early readers were described as preferring quiet activities and enjoyed playing alone more than non-readers. At end of first grade early readers had a median reading score one year higher than the non-early readers.

Durkin, Delores. "Earlier Start in Reading?" Elementary School Journal December 1962. (2)

Durkin feels that reading instruction for the young should not be limited to the gifted. In her study of early reading instruction, she found that many children of relatively low I.Q. benefited measurably from early instruction.

Durkin, Delores, "Early Readers -Reflections After Six Years of Research", The Reading Teacher, Vol. 18, No. 1,(October, 1964) pp 3-7.

The article presents the author's "reflections" on "early readers" on whom her interest has been concentrated for the past six years. She advocates a broad, well-rounded kindergarten program that considers individual differences in children, smaller kindergarten class with longer hours, and encouragement and development of these children who show continuing interest in the written symbol.

Durkin, Delores, "Kindergarten and Reading," Elementary English, (March 1962), p. 274.

Durkin states that the emphasis placed upon readying children to read and even teaching reading in the kindergarten stems greatly from a recognition of changes in young children which reflect changes in our world of living.

It is felt that the kindergarten should adjust its activities to meeting the reading needs of today's children.

Durkin, Delores, "Should the Very Young be Taught to Read? They should Have the Opportunity," NEA Journal, November, 1963, pp. 20-24.

To present views of the author in favor of providing the opportunity for children to have some early reading experiences prior to entering first grade.

Durrell, Donald D.: Nicholson, Alice: Olson, Arthur V.; Gavel, Sylvia R.; and Lineham, Eleanor B. "Success in First Grade Reading," Journal of Education, 140 (Feb. 1958), 1-8. (2)

While Durrell and his co-authors do not consider all aspects of general readiness programs, their study does emphasize the introduction of preliminary work prior to systematic phonic instruction.

Eames, Thomas H. "Accomodation in School Children Aged Five, Six, Seven, and Eight Years," American Journal of Ophthalmology, LI (June 1961), 1255-7.(3)

Eames found in 899 urban and suburban children aged five to eight that there were no cases of accomodation inadequacy among five-year-olds nor among suburban children at any age tested.

Fast, Irene, "Kindergarten Training and Grade I Reading," Journal of Educational Psychology, XLVIII (Jan., 1956), 52-57. (2)

Study points out need for kindergarten reading readiness activities, prior to the child's entrance into grade-one.

Fava, Lorraine E. An Analysis of the Relationship of School Entrance Age to School Achievement, Unpublished Ed.M. Thesis, Boston University, 1957.(1)

To establish relationship of school entrance age to school achievement.

Age was not a detrimental factor to younger group.

Frymier, Jack R., "The Effect of Class Size Upon Reading Achievement in First Grade," The Reading Teacher, Vol. 18, No. 2, November 1964, pp. 90-93.

The purpose of the study was to assess the effect of class size upon first grade reading achievement.

Findings were that the smaller classes showed significantly higher gains in reading than the larger classes. Class size did influence achievement in reading for these students.

Gaskill, A. R.,and Fox, W. C. "How Useful are Psychological Tests for Screening Underage School Beginners?" Journal of Educational Research 57 (Feb. 1964), 333-36. (2)

Gaskill and Fox investigated the effectiveness of the "failing" point on the Pintner-Cunningham Primary Test for predicting difficulty in reading.

Delay was not advantageous for girls but was for boys.

Georgrady, N. P., Romano, Louis, Baranowski, Arthur, "To Read or not to Read - in Kindergarten," Education School Journal 65: 306-311.

To assess the readiness of kindergarteners for initial experiences in recognizing words and symbols.

Findings indicated that children with training made significant gains in symbol recognition-but that the training should be on a selective basis as all children were not sufficiently mature.

Goins, Jean Turner. Visual Perceptual Abilities and Early Reading Progress. Supplementary Educational Monographs, No. 87, University of Chicago Press (Feb. 1958.) (2)

In a study of readiness for the visual tasks involved in reading, Goins in a very thorough study of visual perceptual abilities found that tachistoscopic training in recognizing forms did not influence progress in early reading, but evidence was found indicating the value of the ability to see and keep in mind both a perceptual whole and details within it.

Haley, Elizabeth D.; Dolan, Ann E.; Katz, Mildred; Mackin, Marjorie A. A Comparison of Scores of Kindergarten Children and Non-Kindergarten Children in Specific Background Abilities at First-Grade Entrance, Unpublished Ed. M. Thesis, Boston University, 1957. (1)

To determine (1) whether kindergarten training has beneficial effect on motor coordination as related to letter writing, auditory and visual perception of letters, and knowledge of letter names and sounds, and (2) whether these abilities have definite relationship to increased learning rate.

Children who had had kindergarten experience were generally superior to those who had had no such training.

Hall, R. Vance, "Does Entrance Age Affect Achievement?" Elementary School Journal, 63:391-396. April 1963.

Pupils retained after entrance to Grade 1 in a suburb of Seattle were checked for age of school entrance. At grades 3 and 6 the SRA Achievement Series was administered and an age and sex tabulation made.

It was found that almost three times as many boys as girls had been retained since entering grade 1. Comparing overage (6 years and 6 months or over) and underage (less than 6 years and 6 months) first grade beginners, it was determined that overage pupils achieved at higher levels than the underage group of the same sex and that the difference in achievement increased from grades 3 to 6. Girls were found to consistently achieve at higher levels than boys.

Halliwell, Joseph W., and Stein, Belle W., "A Comparison of the Achievement of Early and Late, School Starters in Reading Realted and Non-Reading Related Areas in Fourth and Fifth Grades," Elementary English, (October, 1964) p. 631.

Was conducted for the purposes of investigating the differences in achievement in the separate subject matter areas between younger and older first-grade entrants at the end of the fourth and fifth grades.

The younger pupils were significantly inferior to the older pupils in almost every academic area evaluated (when the raw scores were converted to grade equivalents) but the mean grade equivalents of the younger pupils were still above grade level. Too, the results of the present study would seem to indicate that although such pupils may do well in comparison with the older pupils of less ability, they will not do nearly as well as older pupils of similar ability.

Hampleman, Richard S. "A Study of the Comparative Reading Achievements of Early and Late School Starters," Elementary English, 36 (May 1959), 331-34.(2)

Hampleman followed groups starting above and below median school entrance age through the sixth grade; his conclusion was that late starters are not handicapped, and may even make slightly better progress than younger groups.

Heilman, Arthur. Principles and Practices of Teaching Reading. Columbus: Charles E. Merrill Books, 1961. (2)

Heilman believes that the readiness period is a highly structured, deliberately teacher-planned program, not a waiting period. He sees it, not as removing individual differences, but as a way to remove blocks to learning, fill gaps, and synthesize new experiences with past ones.

Hillerich, Robert L., "Pre-Reading Skills in Kindergarten: A Second Report",Educational School Journal, 65:312-17 (March 1965).

To present a second report on a 5-year study in Glenview Schools of the effectiveness of a formal program of pre-reading skills in kindergarten. Findings thus far indicate that children who had formal training in kindergarten were better readers at end of first grade than children who had not had such training.

Hughes, Byron O., and Olson, Willard C. The Growth and Achievement of Late-Starting Boys and Girls, University of Michigan, Inter-Institutional Seminar in Child Development, 1960. Education Department of the Henry Ford Museum and Greenfield Village, Detroit, Michigan. (1)

To analyze evidence accumulated at University Elementary School on a group of late-starting boys and girls, i.e., who have an age of beginning reading at or later than 96 months of age.

Data on growth in school achievement show that late-starting boys and girls in University School eventually equal and exceed standards of age and potential.

Hymes, James L., Jr. Before the Child Reads. New York: Row, Peterson, 1958. (2)

In assailing formal readiness activities, Hymes states: "Readiness comes as a healthy child grows and matures. Time is the answer--not special drills or special practice."

Hymes, Dr. James L., Jr., "Early Reading is Very Risky Business," Grade Teacher, March 1963, pp. 88-91.

To voice his opinion objecting to a sit-down, work-book using, child-subduing kindergarten which is advocated by many persons urging "early reading." His alternative is a kindergarten with a program of doing, being, participating, becoming aware, talking, and listening - a place where children are strengthened on a long developmental line of readiness.

Hymes, Dr. James L., Jr., "The Right School Starting Age," Grade Teacher, April 1964, p. 17.

Author's opinion is that by "around three," the usual child has reached a stage in development where he benefits from association with his peers, with a trained teacher, a good program and good equipment. The three year old is ready for good schools, but the school at present is not ready for the 3 year old!

Johnson, Wilma E., The Initiation of an Extended Reading Readiness Program for the Public Schools in Boone County, Iowa. Unpublished M.S.E. Field Report, 1957. (1)

To demonstrate need for extended reading readiness program at kindergarten level. Children were prepared to experience success in learning to read.

Jones, Donald F., Investigation of Some Factors That Influence Reading Achievement, Unpublished M.Ed. Thesis, Illinois State Normal University, 1959. (1)

Chronological age is a good criterion to use in selecting children for readiness. Bright children should be given reading instruction earlier than normal or below-normal children.

Karlin, Robert. "Physical Growth and Success in Undertaking Beginning Reading," Journal of Educational Research, 51: 191-201, November 1957. (1)

To ascertain whether certain measures of physical growth, used alone and in combinations, are related significantly to success in undertaking beginning reading in first year of public elementary school systems.

There was a definite relationship between skeletal development and reading achievement test score.

Keister, V. B., "Reading Skills Acquired by Five-Year-Old Children," The Elementary School Journal, April 1941, pp. 587-596.

To assess the permanence of reading skills acquired by children with mental ages below six years. It is possible for children entering first grade before six to make normal progress in reading during first year; skills attained by such under-age children lack permanence and tend to disappear during summer months between Grades I and II.

King, Inez B. "Effect of Age of Entrance into Grade I upon Achievement in Elementary School," The Elementary School Journal, Vol LV. pp. 331-336.

To determine some of the possible effects, qualitative as well as quantitative, that chronological age at time of entrance to Grade I has on the achievement of pupils in their sixth year of school.

"That having a few additional months of chronological age at beginning of Grade I is an important factor in child's ability to meet imposed restrictions and tensions that school necessarily presents." Older entrants are more likely to achieve up to and beyond grade level.

Krippner, Stanley. "The Boy Who Read at Eighteen Months," Exceptional Children, 30 (Nov. 1963), 105-09. (2)

The precocious development of a four-year-old boy was analyzed in a case study published by Krippner.

Stanford-Binet revealed an I.Q. of 157.

Lynn, R. "Reading Readiness and the Perceptual Abilities of young children", Edu. Res. (London), 6 (Nov. '63).

"To raise doubts about the concept of reading readiness... that children cannot perceive detail accurately until a mental age of 6 to 8."

The author thought his cited evidence sufficient to depose the theory that a mental age of 6-8 was necessary before children can perceive detail accurately. He feels that accurate perception and learning of words may be accomplished at 2½ to 3½ or earlier.

Maddax, Agnes B. A Comparison of Speech Development and Reading Readiness of First-Grade Children in Rhea County, Tennessee, Unpublished M.S. Thesis, University of Tennessee, 1957. (1)

To ascertain whether there is a relationship between reading readiness and ability to produce consonant sounds among first-grade children. The older the child, the fewer the errors of articulation. Children with articulation errors score lower on readiness tests. The higher the child's IQ, the fewer the articulation errors. Boys at this age develop fewer consonant sounds than girls do.

Maggart, Mildred Ensor. A Comparative Study of Reading Readiness Prediction, Unpublished M.S. Thesis, University of Tennessee, 1957. (1)

To investigate relative value, in predicting reading readiness, of certain factors. Chronological age is not closely related to reading achievement in grade one.

Matthews, Eunice. "What is Expected of the Soviet Kindergarten?" Harvard Educational Review, XXIX (Mar. 1959), 43-53. (2)

It is stated that the Soviets look upon the kindergarten year as a time of informed learning with structure limited to the encouragement of language activities which precede reading.

McHugh, Loretta M. The Effectiveness of a Planned Kindergarten Curriculum on Primary Grade Achievement, Unpublished Ed.D. Thesis, Boston University, 1959. (1)

To evaluate effectiveness of a planned kindergarten curriculum on scholastic achievement and social adjustment in the primary grades. Kindergarten group was markedly superior to nonkindergarten group in third-grade total achievement and appeared to have more satisfactory school adjustment.

Micucci, Pat, "Let's Not Teach Reading in Kindergarten!" Elementary English, (March, 1964), p. 246.

Should kindergarten children be taught to read and, if so, how formalized an instruction is desirable? Informal programming in kindergarten better than formal - The kindergarten child should be provided with a variety of activities and experiences.

Moffit, M. W. "Is It True that Children Can Be and Should Be Taught To Read at a Younger Age than Before?" Teaching 600,000 Johnny's to Read. (Proceedings of the Reading Academy of the Elementary Division, N.Y.C. Bd. of Ed., Apr. 1962). (2)

Moffit states that while it is true that children can be taught to read prior to their entrance to grade-one, she questions the desirability of such in regard to its effect upon other areas of the child's development.

Moskowitz, Sue, "Should We Teach Reading in the Kindergarten?", Elementary English, (November, 1965), p. 798.

To determine if formal reading instruction should begin in kindergarten. There is too much research evidence to be ignored showing that children not ready for formal instruction are liable to fail to learn, with resulting hostility toward education; and also that starting formal instruction early, at best, yields little or no advantage in later achievement, when non-early readers tend to catch up and even excel.

Nicholson, Alice. Background Abilities to Reading Success in First Grade, Ed.D. Thesis, Boston University, 1957. (1)

To make extensive and precise inventory of certain perceptual, auditory, and kinesthetic abilities in relation to letters and words in order to discover retention capacities for sight words, and to relate these abilities to chronological age, mental age, and sex of first-grade entrants. Analysis by chronological age quartiles revealed no superiority of older children. Analysis by mental age quartiles revealed significant differences in all background achievements favoring higher mental ages.

Nila, Sister Mary. "Foundations of a Successful Reading Program," Education, LXIII (May, 1953), 543-55. (2)

Emphasizes the need for kindergarten reading readiness activities, preparing the child for grade-one reading instruction.

Oakes, Clifton R., and Plessas, Gus P. "A Language Study of Selected Early Readers," California Journal of Educational Research, 14 (Sept. 1963), 178-86. (2)

They used conventional techniques, analyzing 950 expressions containing 6,889 words. Early readers used a predominance of simple sentences and they used more verbs than any other part of speech.

Olson, Arthur V., Jr. Growth in Word Perception as It Relates to Success in Beginning Reading, Ed.D. Thesis, Boston University, 1957, Journal of Education, February 1958. (1)

To discover relationship between certain word-perception abilities and reading achievement. Letter knowledge has definite relationship to reading achievement. Reliability of reading test was .97.

Olson, Arthur V. "Phonics and Success in Beginning Reading," Journal of Developmental Reading, 6 (Summer 1963), 256-60. (2)

In a study measuring the effects of early teaching of letter sounds and names as well as some other aspects of phonics. Concluded that a knowledge of the relationship between sounds and letters and acquaintance with the names of letters are necessary to the development of a basic sight vocabulary in first grade.

Olson, Willard. Child Development. Boston: D. C. Heath, 1959. (2)

Olson, noted for his work in child development, says he cannot find good evidence that parents and teachers can speed a child through the stages of readiness unless deprivation has existed.

Pincus, Morris, and Morgenstein, Frances, "Should Children Be Taught to Read Earlier?" The Reading Teacher, Vol. 18, No. 1, October 1964, pp. 37-42.

To describe and discuss a new instrument as used at Hamden Hall Country Day School, near New Haven, Conn., with very young (2-5 or 6) children. A typewriter, especially designed for helping children to learn.

Plessas, Gus P., and Oakes, Clifton R. "Prereading Experiences of Selected Early Readers," The Reading Teacher, 17 (Jan. 1964), 241-45.

The nature of prereading activities associated with early success in reading was explored by Plessas and Oakes

(average WISC I.A. = 128)

All had been read to extensively at home and at school, and all had a personal interest in reading.

Powell, Marvin, and Parsley, Kenneth M., Jr. "The Relationships Between First Grade Reading Readiness and Second Grade Reading Achievement," Journal of Educational Research, 54 (Feb.1961), 229-33. (2)

Powell and Parsley observed a rather low relationship between the Lee-Clark Reading Readiness Test and the California Reading Test based upon the time interval of one year.

Russell, David H. Children Learn to Read. Boston: Ginn & Co., 1949. (2)

Russell states that the proper time to start formal reading should be decided on an individual basis, with weight given to aims of parents and schools.

Sheldon, William D. "Research Related to Teaching Kindergarten Children to Read," Reading in the Kindergarten? p. 17, Washington: ACEI, 1962. (2)

Sheldon states that the work of Piaget and others related to the education of five-year-olds seems to indicate that, at this stage in his life, each child needs individual attention. This cannot be accomplished he feels in a rigid atmosphere wherein children are grouped together for formal instruction.

Sheldon, William D., "Should the Very Young be Taught to Read? Harm Might Result", NEA Journal, November 1963, pp 20-24.

To present the author's opinion opposing the controversial topic .

The author advocates a pre-school program "of broad instructured experiences in language aimed at clarifying and building concepts, developing skills of listening and speaking, and promoting the creative use of language as they explore the world about them."

Sheldon, William D. "Teaching the Very Young to Read," The Reading Teacher, December 1962. pp. 163-169.

Evaluating a review of the research literature pertaining to the teaching of reading to the preschool child, Sheldon states: "From the research which is pertinent from studies and observations of five-year-olds in a learning situation, and from the evidence of the later effect of early learning, there seems to be little or no justification for introducing reading into the curriculum at the kindergarten or five-year-old stage.

Spiggle, Lucile W. A Study of the First-Grade Readiness and Early Reading Program of City Park School, Athens, Tennessee, Unpublished M.S. Thesis, University of Tennessee, 1957. (1)

To describe first-grade readiness and early reading program of City Park School, Athens, Tenn. First-grade curriculum should be made less difficult, with slow learner required to read only from primers and mature child from both primer and first reader. All children entering first grade should be 6 years of age by September 1.

Stephey, Fleda M. Factors of Reading Readiness, Unpublished M.Ed. Thesis, Illinois State Normal University, 1957. (1)

To determine relationship between intelligence, chronological age, and sex in regard to readiness for reading. Readiness for reading test results and intelligence test results are good criteria for a teacher to use in determining readiness for reading. Chronological age does not seem to be an important factor in readiness for reading but cannot be considered unimportant; younger age groups should have a longer period of preparation than older age groups. Sex cannot be considered an important factor, although boys may need a longer period of preparation than girls.

Sutton, Marjorie Hunt, "Readiness for Reading at the Kindergarten Level," The Reading Teacher, January 1964, pp. 234-240.

Sutton states, "A growing awareness of the reading potential of many very young children has become evident among some educators in recent months." In concluding her study, Sutton points out that the question of reading instruction at the kindergarten level is not a dichotomy.

Terman, L. M., and Oden, Melita. Genetic Studies of Genius, The Gifted Grows Up, Vol. 4, Stanford, Calif.: Stanford University Press, 1947. (2)

The studies of Terman reported that at least 45 per cent of the children studied in his survey of genius read before the age of five. Terman's studies tended to suggest that early reading was an ability reserved for the gifted and was unusual for average or below average children.

Vernon, M.D. Backwardness in Reading. New York: Cambridge University Press, 1958. P. 277. (2)

Vernon points out that while five-year-olds can be successful in visual discrimination activities, they have real problems in auditory discrimination. It is also asserted that the short attention span of young children has a negative effect on sequential learning.

Vernon, P. E., O'Gorman, M. B., and McClellan, T. "Comparative Study of Educational Attainments in England and Scotland." British Journal of Educational Psychology, XXV (1955), 195-203. (2)

This report indicates that eight-year-old Scottish children who were taught to read at the age of five were not significantly more able in reading comprehension than a comparable group of English children whose reading instruction began at the age of six.

Von Wie, E. K., and Lammers, D. M. "Are We Being Fair to Our Kindergarteners?" Elementary School Journal, Apr. 1962. (2)

Von Wie and Lammers, reporting on an advanced kindergarten program in two schools, wrote: "Mentally, emotionally, and physically most of the children were ready for more advanced learning . . . They were able to express themselves well and they indicated an interest in reading."

Williams, Estelle M. The Teaching of Reading in the First Grade, Unpublished M.Ed. Thesis, University of Southern California, 1958. (1)

To determine factors affecting reading readiness and to ascertain when reading instruction should begin. Best time to begin reading instruction is when pupil has achieved mental age of 6 years, 6 months.

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(1) Excerpts from: Research in Reading at the Primary Level, Doris V. Gunderson, U. S. Dept. of Health, Educ., and Welfare. Bull. 1963, No. 42.

(2) Excerpts from: The Reading Teacher, (various issues).

(3) Excerpts from: Journal of Educational Research, Vol. 55, No. 5, February, 1962.

13.

STATE OF GEORGIA

19TH TEACHER EDUCATION CONFERENCE

ANNOTATED BIBLIOGRAPHY: TYPES OF ELEMENTARY SCHOOL ORGANIZATIONS--THEIR IMPLICATIONS FOR EARLY EDUCATIONAL STIMULATION AND TEACHER EDUCATION

James B. Kenney
Bureau of Educational Studies
and
Field Services

SELF-CONTAINED CLASSROOM VS. DEPARTMENTALIZATION

Addington, Karen, "Effect of Departmentalization in Elementary School on Pupil Achievement," *Florida Journal of Educational Research*, 4:51-52, January, 1962.

A study to describe achievement of elementary pupils during a year in self-contained classroom and the following year in departmentalized classes.

Anderson, Richard C., "The Case for Teacher Specialization In The Elementary School," *Elementary School Journal*, 62:253-60, February, 1962.

An agrument for departmentalized elementary school based on the belief that teacher specialization is a "facilitating factor for greater achievement, more profound learning, greater interest in learning, and better social and emotional development for the student."

Barnes, Ronald E., "A Survey of Status and Trends in Departmentalization in City Elementary Schools," *Journal of Educational Research*, 55:291-2, March, 1962.

A report of a survey to determine whether emphasis on subject matter was reinforcing trend in departmentalization.

Bateman, Emerson B., "Partial Departmentalization Above Grade 3 Is The Answer," *The Instructor*, 72:10-11, February, 1963.

An enumeration of the pros and cons for departmentalization in the elementary grades.

Broadhead, Fred C., "Pupil-Adjustment In The Semi-departmental Elementary School," *Elementary School Journal*, 60:385-90, April, 1960.

An experimental study to determine differences in adjustment between fifth graders in semi-departmental and self-contained classrooms.

Burnsworth, Charles C., "The Self-contained Classroom Reconsidered," *Music Educators Journal*, 48:41-42, November-December, 1961.

This article questions the practicality of the self-contained classroom and gives opinions, in the light of present practices, for the improvement of the music program in elementary grades.

Coffin, Gregory C., "Are Your Elementary Grades Properly Organized," *School Management*, 5:61, December, 1961.

A report of one year's departmentalization of fourth, fifth, and sixth grades in four Reading, Pennsylvania schools.

Coffin, Gregory C., "The Effect of Departmental Teaching on Academic Achievement of Children in Grades Four, Five, and Six," University of Connecticut, 1963, Dissertation Abstracts, 24:4488-9, May, 1964.

A study to determine the effect of departmentalization in the elementary grades.

Cothron, Joe M. "Departmentalization In The Intermediate Grades," Alabama State Teachers Association Journal, 6:23-24, December, 1963.

Another article which explores the advantages and disadvantages of departmentalization, which can be a "wonderful experience," according to Mr. Cothron.

Dunn, Mary, "Should There Be Any Set Type of Elementary School Organization?" Elementary School Journal, 53:199-206, December, 1952.

Sixty-three city school systems throughout the United States were surveyed to determine how needs of children can best be served through organizations of instruction. Arguments in favor of both the self-contained classroom and the departmentalized system are presented.

Goodlad, John I., and others, "Readiness Levels Replace Grades in the Non-graded Plan," Elementary School Journal, 57:253-256, February, 1957.

Here is an excellent discussion of how a non-graded primary may be organized according to reading levels. The author closes with pertinent suggestions for initiating structural changes.

Gunn, James I., "How Small Districts Can Use Departmentalization and Ability Grouping," School Management, 8:51-53, August, 1964.

A description of a system of departmentalization based on teacher rotation and ability grouping of the students. This system employs the three period day.

Hansen, Richard G., "A Study of Elementary School Organization," Dissertation Abstracts, 14 PT. 1:489-90, 1954.

Hansen surveyed teachers and prospective teachers for views on the self-contained classroom as compared with the semi-departmentalized organization which had specialists for art, music, and physical education. He concludes that larger classes make special teachers feasible and also make fewer classrooms necessary.

Hefferman, Helen, et. al., "The Organization of the Elementary School and the Development of A Healthy Personality," California Journal of Elementary Education, 20:129-53, February, 1952.

This article presents school practices, the authors basing their judgment on research and experience. Here the disadvantages of departmentalization far outweigh the advantages.

Hillson, Maurice and Romona Karlson, "Change and Motivation in Elementary School Organization," New York: Holt, Rinehart, and Winston, 1965, 387 pp.

A volume of readings on types of elementary school organizations, with enumeration of advantages and disadvantages of departmentalization.

Hosley, Charles T., "Learning Outcomes of Sixth Grade Pupils Under Alternate Grade Organization Patterns," Dissertation Abstracts, 14 PT. 1:490-91, 1954.

A review of an experimental study which compared learning outcomes of sixth grades in departmentalized schools with the learning outcomes of sixth graders in self-contained classrooms.

Imhoff, Myrtle, and Wayne Young, "School Organization," Review of Educational Research, 29:155-164, April, 1959.

Here is an overview of the research in the areas of enrollment, size of classes and its effect, reorganization and grouping trends, promotion practices, length of the school day, and the control of the federal, state, and local governments. A very brief historical background is given for each area.

Jarvis, Oscar T., "Door Opens in Self-contained Classrooms to Let In Specialists," Nation's Schools, 74:33, December, 1964.

A report of the status of organization patterns in use in the intermediate grades in sixty-four metropolitan areas.

Lambert, Philip, William L. Goodwin, and William Wiersma, "A Comparison of Pupil Adjustment In Team And Self-contained Organizations," Journal of Educational Research, 58:311-14, March, 1965.

A report of an experimental study carried on over a period of two years comparing personal and social adjustment of students in a team situation to that of students in a self-contained classroom.

Lobdell, Lawrence O. and William J. Van Ness, "The Self-contained Classroom in the Elementary School," *The Elementary School Journal*, 63:212-17, January, 1963.

The development of departmentalization in the primary and intermediate grades and the "excuses" for departmentalization.

Ogle, A. V., "How Tulsa Teaches the Grades," *American School Board Journal*, 136:23-25, April, 1958.

A review of a successful semi-departmentalized elementary education method by the director of elementary education in Tulsa, Oklahoma.

Otto, Henry J., "Survey Data On Departmentalized Teaching In Elementary Schools," *Journal of Educational Research*, 42:105-12, October, 1948.

A study of 532 elementary schools to determine current practices of departmentalized teaching.

Phelps, Roger P., "Music in the Self-contained Classroom," *Music Educators Journal*, 43:36-49, February-March, 1957.

Although the purpose of this article is to explore the effectiveness of music in the self-contained classroom, it lists faults of the departmental classroom which can be applied to the entire curricula.

Rouse, Margaret, "A Comparison of Curriculum Practices in Departmental and Non-departmental Schools," *Elementary School Journal*, 47:34-42, *September*, 1946.

A report of a survey to discover differences, if any, between departmental and self-contained organizations at the fourth and fifth grade levels. Aspects considered were classroom teaching procedures, curriculum practices, and scope of school program.

"Trends in City-School Organizations--Departmentalization in Elementary Grades," *Research Bulletin*, National Education Association, 27:4-39, February, 1949.

This bulletin reports the results of a survey to ascertain status of school organizations in 1600 city school systems throughout the United States.

Zimmerman, William A., "Departmental and Unified Seventh Grade Programs in English and Social Studies: A Study of Change in Subject Matter Achievement and Personal Adjustment," *Dissertation Abstracts*, 23:517, 1962.

A study to compare English and Social Studies achievement and personal adjustment of pupils in departmental and unified seventh grade classes.

ADMINISTRATION AND ORGANIZATION

Blake, Roy F., "Small Group Research and Cooperative Teaching Problems," National Elementary Principal, 43:31-6, February, 1964.

Represented here is a lucid article which summarizes research on small groups and implications for team cooperation and leadership problems. Possible structural and operational solutions are given.

Dean, Stuart E., Elementary School Administration and Organization, U. S. Department of Health, Education, and Welfare, Bulletin, 1960, No. 11, Washington: Government Printing Office, 1960.

A survey of fifty-two systems in cities of 10,000 or more to determine practices and policies of elementary school organization and administration.

Emalw, Rita, "Organizing Schools for the Future," Educational Leadership, 14:288-292, February, 1957.

Here is a very interesting article describing significant movements which have begin in our schools today and will play an important role in the schools of the future.

Goodlad, John I., "Classroom Organization," Encyclopedia of Education Research, 1960, p. 221-226.

The author provides a historical overview of both vertical and horizontal school organization practices. He traces trends in graded versus nongraded approaches through the recent decades. He raises pertinent questions concerning class size, large group instruction, child security, and use of electronic media.

Goodlad, John I., "News and Comments," Elementary School Journal, 59:1-17, October, 1958.

Described is a comprehensive report on action to improve schools in the communities of Englewood, Florida; Flint, Michigan; Fort Wayne, Indiana; and University City, Missouri.

Mary Alice, Sister, R.S.M., "Administration of the Non-graded School," Elementary School Journal, 61:148-152, December, 1960.

The author discusses the role of the administrator in initiating a non-graded primary.

Mary Alice, Sister, R.S.M., "New Ventures in School Organization - The Ungraded School and Use of Teacher Aids," Elementary School Journal, 57:268-271, February, 1957.

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Brinkman, Albert R., "Now It's the Ungraded School," Education Digest, 27:5-7, October, 1961.

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Carbone, Robert F., "Comparison of Graded and Nongraded Elementary Schools," Elementary School Journal, 62:82-88, November, 1961.

The basis for this article is the author's doctoral research. Carbone tested three hypotheses: is there a difference in achievement, mental health, or teacher instruction methods in the graded and nongraded approach. He discovered a significant difference in favor of graded in the achievement and mental health. His interpretation of his results are very worthwhile.

Carbone, Robert F., "Non-Graded School: Myth or Miracle?" *Montana Education*, 39:17-18, November, 1962.

The author bases this article upon the results of his research. A very basic question is raised regarding the nongraded school.

Dean, Stuart E., *Elementary School Administration and Organization*, U.S. Department of Health, Education, and Welfare, Bulletin 11, 1960, 126 pp.

A survey regarding the growth and future of nongraded schools is reported.

Dean, Stuart E., "The Nongraded School: Is There Magic In It?" *School Life*, 47:19-23, December, 1964.

A brief discussion of the pros and cons of the nongraded school, taken from observation and from reports of educators and researchers.

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A study of the degree of success of the ungraded primary program developed in Lincoln, Nebraska, in relation to pupil achievement and pupil attitude toward school.

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15

EDUCATIONAL STIMULATION IN THE SOCIAL STUDIES

Analysis and Interpretation of Research

by

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Abstract of Research and Opinion Articles

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TABLE OF CONTENTS

Page

Introduction 1

I. Analysis and Interpretation of Research 3

A. Introduction 3

B. Knowledge Before Instruction 5

Social Science, Kindergarten 5
Social Studies, Grade 2 6
Social Studies, Grade 3 7
Political Socialization, Grades 2-8 8
Geography, Map location, Grade 2 11
Geography, Map ability, Grade 4 13
Time Relationships, Grade 2 14
Time Relationships, Grades 4-8 15
Interests, K-8 16
Social Studies, Grade 2, Negative Interpretation 17
Summary 20

C. Knowledge After Instruction 22

Social Science, Kindergarten 23
Anthropology, Grades 1 and 4 25
Economics, Grade 1 30
Government, Grades 2, 3, and 4 32
Geography, Map Skills, Grade 3 33
Geography, Desk Maps, Grade 4 34
Geography, Map Learning, Overlay Projecturals, Grade 5 36
Geography, Time Zones, Grades 4, 5, 6 39
Geography, Generalizations, Mexico, Grade 6 40
Historical Chronology, Ancient, Grade 6 42
Social Science Generalizations, Grade 6 45
Public Controversy and Conceptualization, Grades 7-8 46
Summary 48

D. Needed Research in Social Studies Education 51

II. Abstract 60

A. Research: Knowledge Before Instruction 60
B. Research: Knowledge After Instruction 61
C. Opinion Articles 62
D. Bibliography 64

Introduction

> The basic hypothesis that unifies the whole program of activities of the Research and Development Center in Educational Stimulation, Ages 3-12, is that early and continuous intellectual stimulation of children, ages 3 through 12, through structured sequential learning activities will result in higher levels of ultimate achievement than would otherwise be obtained. Intellectual and psychomotor development is most rapid at these early ages and most subject to constructive modification.[1]

This review of social studies literature is restricted to articles pertinent to the basic hypothesis of the Research and Development Center in Educational Stimulation which have been published during the period 1955-1965.

Most articles relate generally to a broadly and vaguely defined social studies area rather than to curriculum or instruction in a particular social science. Geography predominates as the social science accorded separate treatment, largely as a result of the fact that geographic educators prefer to use the subject designation of their discipline, whereas social studies educators frequently use the term "social studies" as a subject synonym. Futhermore, the Journal of Geography, as its name indicates, provides an outlet for specialized articles, whereas Social Education, as the title indicates, publishes articles which are social studies oriented.

The number of research articles approximates the number of opinion-type articles. Several of the research articles for various reasons seem to lack validity or reliability. Of twenty-one research articles and seventeen opinion articles, only twelve appear to have substantial significance.

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[1] "Proposed Research and Development Center in Educational Stimulation at University of Georgia," College of Education, University of Georgia, Athens, Georgia, 1965 (Mimeographed).

This paper identifies trends and conclusions which have implications for the earlier cognitive stimulation of children through the content variable of the social studies. General reviews of social studies research are found in recent issues of Social Education.[1]

This paper is divided into two parts. The first part is a somewhat lengthy and detailed analysis and interpretation of research in elementary social studies. Part I treats knowledge before instruction and knowledge after instruction. Part II is an abstract of pertinent research with some reference to opinion articles.

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[1] Sylvia E. Harrison and Robert J. Solomon, "Review of Research in Teaching the Social Studies: 1960-1963," Social Education, May 1964, pp. 277-292; "Review of Research in Teaching of the Social Studies: 1964," Social Education, May 1965, pp. 281-290, 298.

Educational Stimulation in the Social Studies: Analysis and Interpretation of Research

by

Marion J. Rice

A. INTRODUCTION

Research conducted in the last ten years indicates that children have substantial knowledge of, or interests in, social studies prior to instruction, and that children can learn more difficult and abstract social studies content at an earlier level than is presented in the traditional social studies curriculum.

Traditional social studies units, particularly primary, have literally applied the expanding environment theory[1] and have emphasized content dealing with the home, school, and community.[2] Despite the alleged fluidity of the social studies program, this pattern has become institutionalized in textbook and study guides. Trends in elementary social studies curriculum as reported in 1962 by Furman and Ellsworth[3] and a 1962 recommendation by an ad hoc committee of the National Council for the Social Studies[4] are largely a restatement of elementary curriculum practices which have been current for the past years and which were described in 1957 by the National Society for the Study of Education[1] and in 1960 by Hill.[2] While there are a number of curriculum development projects underway which promise innovations in elementary social studies content, it is still too early to evaluate their implications, due to the newness of the projects and the lack of published research findings.[3]

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[1] See for example Paul R. Hanna, "Revising the Social Studies: What is Needed?" Social Education, April 1963.

[2] Elementary social studies texts published by the major publishing companies, as well as units and guides prepared by state and local groups, reflect this emphasis.

[3] See articles by Dorothy W. Furman and Ruth Ellsworth in John U. Michaelis, editor, Social Studies in Elementary Schools. Thirty-Second Yearbook of the National Council for the Social Studies. (Washington, D. C.: National Council for the Social Studies, 1962), pp. 89-130.

[4] "The Social Studies and the National Interest." Report of an ad hoc Committee of the National Council for the Social Studies, Annual Meeting, November 1962 (Mimeographed).

The premises that elementary children can learn more social studies content and that more content can be transmitted at earlier ages, have nevertheless been stated as informed opinion in a number of articles[4] and explicitly examined in a number of short-term research studies. These studies have usually challenged the expanding environment principle, explicitly or implicitly,[5] and the point of view that children's interests are largely maturational.

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[1] Dorothy McClure Fraser, "The Organization of the Social Studies Curriculum," in Nelson B. Henry, editor, Social Studies in the Elementary School, The Fifty-Sixth Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1957), pp. 129-162.

[2] Wilhelmina Hill, Social Studies in the Elementary School Program. Bulletin 1960, No. 5, U. S. Department of Health, Education and Welfare, U. S. Office of Education (Washington, D. C.: U. S. Government Printing Office, 1960).

[3] John U. Michaelis and Edwin Fenton, "Where Are We Headed? Two Analyses of Social Studies Curriculum Projects," Seventh General Session, 45th Annual Meeting, National Council for the Social Studies, November 27, 1965; Sylvia E. Harrison, "A Summary of Current Social Studies Curriculum Projects," Test Development Report (TDR-64-6) (Princeton, N. J.: Educational Testing Service, November 1964).

[4] Ronald O. Smith and Charles F. Cardinell, "Challenging the Expanding-Environment Theory," Social Education, March 1964, pp. 141-143.

[5] O. L. Davis, Jr., "Children Can Learn Complex Concepts," Educational Leadership (Washington, D. C.: Association for Supervision and Curriculum Development, National Education Association, 1959) December 1959, p. 170; Antonetta Capper, "Science and Social Studies: Small Beginnings for Four-and Five-Year Olds," Childhood Education, December 1958, pp. 172-177; Alexander Frazier, "Lifting Our Sights in Primary Social Studies," Social Education, November 1959, pp. 337-340; John Jarolimek, "Curriculum Content and the Child in the Elementary School," Social Education, February 1962, pp. 58-59.

There are two usual types of research design. The first is simply a descriptive test using selected subjects to ascertain the status of childrens' knowledge at a given age or grade. The second involves a pre-test to determine the extent of social studies knowledge before instruction, instruction in social studies content different from that customarily presented, and a post-test to ascertain the extent to which children have learned the new content. The population receiving the new instruction is designated "experimental" and the population merely administered the pre- and post-tests, but not receiving the new instruction, is designated as "control." Standardized and criterion measures are usually applied to both experimental and control subjects.

This survey of the research literature is divided into two parts: Section B examines studies which emphasize knowledge before instruction; Section C emphasizes knowledge as a result of instruction. The review concludes with suggestions for needed research.

B. Knowledge Before Instruction

Eight research-type studies and one survey study support the premise that children know more before instruction than is usually assumed. Only one study takes data, which might otherwise be considered as favorable, and uses it to question the premise. Grade placement of the research-type studies were: Kindergarten, 1; Grade 2, 4; Grade 3, 1; Grade 4, 1; Grade 2-8, 1; and 1, Grades 4-8, 1. By content, four dealt with social science; one political socialization; two maps, and two time. All of the studies were single investigations.

Social Science Knowledge, Kindergarten. Spodek[1] conducted a study to ascertain if a spiral curriculum could be begun at the kindergarten level, and it is described in more detail in Section C. One aspect of the study was an oral pre-test, in which scores ranked from 10 to 34, with a mean of 19.4. The investigator reports that prior to instruction children knew what a map was, could make some elementary differentiation among map symbols, had some knowledge of the long ago and know that changes have taken place in the world in time.

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[1] Bernard Spodek, "Developing Social Science Concepts in the Kindergarten," Social Education, May 1963, pp. 253-256.

Social Studies Content, Grade 2. Restricted to the question of knowledge prior to instruction is a study limited to one grade. Lowry[1], utilized two instruments -- a survey test based on 110 concepts common to at least two of six social studies text books examined for common concepts taught at the second grade level, and oral interviews measuring 105 of the 110 concepts, tape recorded. There is no definition or illustration of concept. Subjects consisted of 287 second graders to whom the survey test was administered; from this number a second sample of 100 children were selected for oral interviews.

Lowry reports that the total mean per cent of concepts known by the 287 children, as revealed by the survey test, was 84.62 per cent. The total mean per cent of achievement on oral interview responses was 63.68. Difference in oral interview as compared with survey test achievement is attributed to the nature of the interview and the absence of choice cues, as on the survey test. Another finding was that achievement differs by content areas, but the only areas specified were 91.78 mean per cent of correct answers for Libraries and 79.31 in the Foods area.

She concludes that "Children come to second grade with a partial knowledge of the common social studies concepts taught at the second grade" and suggests that social studies content ought to be up-graded, especially where an evaluation of understanding before instruction indicates substantial previous knowledge.

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[1] Betty Lucile Lowry, "A Survey of the Knowledge of Social Studies Concepts Possessed by Second Grade Children Previous to the Time These Concepts are Taught in the Social Studies Lessons," Dissertation Abstracts, December, 1963, p. 2324.

The lack of definition of concept, the unusually high mean per cent of correct responses, the lack of technical details concerning research procedures, and the long list of recommendations for up-grading of social studies content, some of which appear to be theoretically inconsistent with the study, might indicate that Lowry was more zealous than scholarly in her study.

Social Studies Content, Grade 3. More rigorous than the Lowry study is one by Kaltsounis,[1] also limited to a single grade. In this study he sought to ascertain the extent to which beginning third-grade children know third grade social studies cognitive content, as it is presented in third grade social studies textbooks, before study. Three categories of cognitive content, according to Bloom's Taxonomy, were considered -- knowledge, comprehension, and application. The population consisted of 183 beginning third-grade pupils of three elementary schools in Mattoon, Illinois. The main instrument was an investigator constructed sixty item multiple choice test drawn from the content of five major third-grade social studies textbooks.

He found that the estimated mean of known responses represented about 37 per cent of all responses; that performance in the knowledge category was greater than performance in the comprehension and application categories; that there was a coefficient of correlation of r.=.71 between IQ and prior knowledge of social studies content; there was no postive correlation between chronological age and prior knowledge, using the Pearson product-moment coefficient of linear correlation; and that there was a sex difference in favor of boys in prior knowledge. Kaltsounis made no recommendations concerning social studies curriculum development as a result of his investigation.

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[1] Theodore Kaltsounis, "A Study Concerning Third Graders Knowledge of Social Studies Content Prior to Instruction," Dissertation Abstracts, November 1961, p. 1528.

His finding of correct responses prior to instruction is considerably lower than the pretest scores of Arnoff, discussed in Section C, and of Lowry. While the general premise may be accepted that children know a certain amount of content before instruction, reported figures of how much children know must be viewed with caution. In the first place, the number of subjects in these studies, except for Easton and Hess, are relatively small and drawn from a single school system, often a few schools within a particular system. In the second place, variability in investigator constructed tests, based on personal interpretations of social studies content at a particular grade level, may be so great that any conclusion, other than the reporting of a general trend or tendency on that particular test, may not be generalized.

Political Socialization. Grades 2-8. The Easton and Hess study[1] is a descriptive study of children's political values and attitudes. It emphasizes that "Every piece of evidence indicates that the child's political world begins to take shape well before he even enters elementary school and that it undergoes the most rapid change during these years." While the conclusion that political learning gets a good start in the family during the pre-school period is not new, in view of the long history of studies dealing with socialization,[2] the study is significant for social studies instruction because it presents a theoretical nine matrix framework for the analysis of political socialization and explicitly deals with political orientations rather than generalized attitudes. The data collecting instruments consisted of tests and interviews in selected areas of political socialization and the national sample involved twelve thousand elementary school children.

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[1] David Easton and Robert D. Hess, "The Child's Political World," Midwest Journal of Political Science, August, 1962, pp. 229-246.

[2] See especially the review of studies of political socialization in Chapter II, "Sub-Group Differentiations in Pre-Adult Life" in Herbert Hyman, Political Socialization (Glencoe, Ill.: The Free Press, 1959).

Findings of the study are that "the truly formative years of the maturing member of a political system would seem to be the years between the ages of three and thirteen;" that "By the time children have reached second grade (age 7) most of them have become firmly attached to their political community;" that "firm bonds are welded to the structure of the regime quite early in childhood" notwithstanding the fact that "children know very little about formal aspects of the regime and much less, if anything, about its informal components;" and that positive ideals about government are evinced very early, mediated through the father-President idealization of authority. Thus even when elementary children, in the prevailing course of instruction, do not become familiar with such a basic concept as political party until the fourth or fifth grade, definite party identification is discernible as early as the second grade. Throughout the elementary grades, there is evidence of the ability to accept and tolerate partisan commitment.

While Easton and Hess were primarily interested in drawing conclusions relating to the process of socialization to the stability of a democratic political system, in a companion article[1] they state "It seems likely that formal programs of citizenship training and education might be more effectively placed at the pre-high school level than at later phases of formal education." Cammarota,[1] presented a precis of the Easton and Hess study with the recommendation that government be taught in each grade in a spiral curriculum. She commented that political material in elementary textbooks, particularly in grades K-4, is only introduced in such an incidental manner that children's ideas of the political world are formed "in spite of the school rather than because of it."

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[1] Robert D. Hess, "The Role of the Elementary School in Political Socialization," School Review, Autumn 1962, pp. 257-265.

The implications of the Easton and Hess study for social studies is that the school should give more emphasis to the transmission of knowledge about government and political institutions, since democratic attachments are developed within the total process of socialization and school emphasis on attitudes and values merely reinforces a pre-existent attitudinal-value system primarily derived from the family.

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[1] Gloria Cammarota, "Children, Politics, and Elementary Social Studies", _Social Education_, April 1963, pp. 205-207, 211.

Geography, Map locational abilities, Grade 2. McAulay[1] tested the ability of second grade children to locate places in space. The subjects consisted of 214 children from five classrooms in Eastern Pennsylvania with a mean chronological age of seven years, seven months with an IQ range of from 65 to 145. Two classrooms contained children from a farming community; two classrooms were selected from a suburban area of a large eastern city with families predominantly skilled worker and small business men; and the fifth classroom was drawn from children of professional and semi-professional families.

The instrument consisted of four simple picture maps, each of which had a number of questions relating to location, distance, space, size, and time relationships. The map problems were read by the classroom teacher; observers noted and recorded children's responses which were summarized on a per cent correct basis.

Map 1 consisted of a community pictograph of school, park, house, two stores, and a movie; problems related primarily to distance. Map 2 depicted a schematized terrain in which the children lived, and included a mountain, river, bridge, house, and traveler; questions concerned the relationship of topography to travel. Map 3 concerned the relationship of the United States to Japan, separated by a body of water, and the relationship of two residence areas in California; questions concerned travel time and water-land mass size. Map 4 depicted the relationship of bodies in space, and showed the sun, earth, moon, a space platform, and a space craft; questions concerned travel time, distance, and size of bodies.

McAulay summarized with some precision may question responses, which indicate that second grade children who have not had formal instruction in map usage solve map questions relating to the home environment; associate map symbols with realistic situations; compare linear distances on a map; understand three dimension in maps and see the relationship between local topography and a picture map; comprehend large distances and the relationship of widely separated masses; understand the relationship of distance to time; are aware of the concept of distance in space; and understand the map relationship of earth, moon, and sun. Percentage of children giving correct responses ranged from a low of 67 per cent on a question relating to the distance in the home environment to a high of 97 per cent on the relative size of Japan and the Pacific Ocean.

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[1] J. D. McAulay, "Some Map Abilities of Second Grade Children," The Journal of Geography, January 1962, pp. 3-9.

In contrast with the usual assumption that map usage should be based on the immediate environment, McAulay found that "The wider and more removed the physical environment from the local, known community the more efficient the second grade child seemingly becomes in following and understanding map directions."

Weaknesses of the study mentioned by the investigator concerned the simplicity of the investigator constructed picture maps, impreciseness and inadequacy of the questions, and unrepresentative sample, largely from middle and upper socio-economic homes. While the validity and reliability of the testing procedure were not established, the study suggests that the systematic study of map skills other than of the local neighborhood may be introduced earlier than is customarily recommended and that children bring to map usage a generalized ability to move from the concrete to a representation. It is possible that the formal study of map skills[1] and use of the globe[2,3] should be initiated earlier than the fourth grade

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[1] For traditional map skills Kindergarten-Grade II, see, for example, Rose Sabaroff, "Making and Reading Maps," pp. 56-66 in Teacher's Edition in the Neighborhood (Chicago: Scott Foresman, 1963) and John U. Michaelis, Social Studies for Children in a Democracy, (Third Edition, Englewood Cliffs, N.J.: Prentice Hall, 1963), p. 433.

[2] Ruby M. Harris, The Rand McNally Handbook of Maps and Globe Usage, (Third Edition; New York, 1960) p. 59.

[3] Preston E. James, editor, New Viewpoints in Geography, Twenty Ninth Yearbook of the National Council for Social Studies (Washington, 1959,) p. 124.

Geography, Map Ability, Grade 4. A second McAulay map study[1] was related to map learning in the fourth grade. Most of the study related to achievement after instruction, and will be discussed in detail in Part II, but one question was "Have fourth grade children acquired map knowledge through travel and mass media?" The two instruments used to answer this question were an investigator constructed eight item parental questionnaire and Form AA of the California Test in Social Studies II related to geographic understandings. The questionnaire indicated that children in Class A had a greater opportunity to achieve geographic understanding than children in Class B, based on the number of families with a map and globe in the home and travel outside Pennsylvania. The results of the pre-test were not given, merely the gain in geographic understanding based on the administration of Form BB and t-test computation.

The parental questionnaire would seem to be a poor way of defining geographic opportunity, and there is no quantitative definition of geographic knowledge based on pre-test. The major conclusions relating to this question was that "Children may have the opportunity to acquire some map knowledge through the home and community environment but such knowledge must still be directed and coordinated within the social studies program." This is simply a statement of the obvious, since maps and geographic information are a part of our culture and most children cannot escape some exposure to incidental geographic information. Furthermore, these children had been in school for three years, and a school culture, even in the primary grades, does include some geographic understanding. The conclusion that fourth grade pupils are sufficiently mature to undertake systematic map study, is also weak, particularly in view of the rather enlarged picture of second grade children's map abilities prior to instruction the investigator gave in another study. The study, however, is actually a comparison of increments of social studies learning in which there is systematic as compared with unsystematic instruction in maps, and only relates incidentally to the question of knowledge before instruction.

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[1] J. D. McAulay, "Map Learning in the Fourth Grade," The Journal of Geography, March 1964, pp. 123-217.

Time Relationships, Grade 2. In another study, McAulay[1] sought to determine if second grade children have developed understandings of time associated with self, the immediate environment, and historical events. Time relationships were defined to mean duration, existence, and progress affecting persons, things, and events.

Subjects consisted of 228 second graders with varied socio-economic backgrounds, ranging from lower socio-economic to college community. The instruments consisted of an oral interview schedule, in which problems dealing with time were given individually to each subject. A record was made of the responses and the responses were analyzed to ascertain time relationship concepts. Responses were neither scaled nor statistically treated.

The investigator reports that second graders have little understanding of time continuity but that they seem to understand time periods. They also have some understanding of past social reality if not related to the immediate concern or environment of the child, and that past-present associations improve with removal from the self and immediate environment. The author concludes that the present social studies curriculum underestimates a child's understanding of time. Notwithstanding assumptions about the immediate environment as the basis of instruction, the child has little understanding of time phonomena related to the family and community. No explanation is advanced as to why there is a lack of time sense in regard to self, family, and community. In the judgment of this reviewer, it is because the context of self, family, and community does not emphasize time usage, except to identify the present.

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[1] J. D. McAulay, "What Understandings Do Second Grade Children Have of Time Relationships," Journal of Educational Research, April, 1961, pp. 312-314.

Time Relationships, Grades 4-8. In another time study, Legere[1] constructed an instrument to measure time concepts and relationships of children in Grades 4-8. Subjects consisted of 150 to 200 children at each grade level. The testing instrument consisted of a five-part time relationship test containing 80 items of a four distractor, multiple choice variety. Two forms were produced--one for Grades 4, 5, and 6 and a second form for Grades 7 and 8. The five parts consisted of: vocabulary, knowledge of time systems and relations, time-oriented problem solving ability, abstract time relations, and time interrelationships.

The test was specifically constructed to test three hypotheses: time relationship understanding is a tri-factored (associative, spatial, mathematical) element displaying parallel and inter-related growth during the maturation of the individual; children display a higher degree of sophistication in this time understanding than previous research indicates; and time relationship measurement may be achieved as a separate and unique measure.

The investigator reported that test findings supported the hypotheses. Specifically, he reported that there is a progressive improvement of time understanding ability on total and sub-test scores through the grades. As children progress, time understandings become more alike with a tendency toward group homogeneity; and that time relationship understanding may be isolated and evaluated separate from social studies, reading, or general achievement and intelligence.

Children display a tri-factored element in their use of time understanding. Associative time understanding is the most difficult to use effectively; the mathematical is used earliest. The ability to use associative, spatial, and mathematical elements develops independently in a parallel manner, and is interrelated when used to deal with multi-factored problems or concepts.

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[1] C. L. John Legere, "An Investigation of Time Relationship Understandings in Grades Four Through Eight," Dissertation Abstracts, November 1962, p. 1625

Since this study did not use any type of control test, it is possible that acceptance of the first hypothesis is merely in line with the self-fulfilling prophecy of a specially constructed test--a test specifically designed to test a particular hypothesis inevitably supports the hypothesis. Since Legere gives no comparable data, it is difficult to put into perspective the conclusion that "Children are able to know and use time concepts earlier than previous research indicates." This is in line, however, with an implicit premise of the study, since it was assumed that the results of the study would support "accelerated teaching."

Interests, Grades K-8. Under the ambitious title "Challenging the Expanding Environment Theory," Smith and Cardinell[1] report their conclusions to an analysis of free association responses to a list of five cue words administered to 2,500 children in the Portland, Oregon school system in grades K-8. The objective of the study was to determine to what extent elementary school children have interests beyond their immediate environment. The five cue words were honesty, India, river, Washington, and world.

There was no uniformity in method of administering the cue words or gathering the responses. The authors admit that the study cannot be regarded as scientific research, but allege that it shows that children have interests beyond their immediate environment. The authors also state that since children have many clearly defined conceptions, even if erroneous, there is a need for more effective instruction earlier.

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[1] Ronald O. Smith and Charles F. Cardinell. "Challenging the Expanding Environment Theory." Social Education, 28: 141-144; March, 1964

Social Studies, Grade 2, Negative Interpretation. Mugge[1] is one of the few writers to question the ability of young children to study far away people and places and the contribution of television to the increasing knowledge of children prior to school instruction.

To answer the question "just what information young children can be expected to have in the area of social studies," the investigator studied twenty second graders, 10 boys and 10 girls, selected at random from two counties in eastern Pennsylvania but representative of rural, urban, and suburban residential areas. In the pilot sample, the median IQ was 113 with all children from middle, socio-economic groups. A month later revised instruments were administered to 180 children, selected by the same criteria.

The instrument consisted of an investigator constructed social studies test divided into four parts: information, knowledge beyond immediate environment, a definition questionnaire, and a questionnaire relating to experiences. The information items were obtained, as with similar tests, by utilizing social studies text books, appropriate to the grade level. "Recent" courses of study, which suggested some content beyond the immediate environment, were [illegible] sources for the second part. The definition questionnaire was used to clarify understanding of terms used in the first part dealing with information. An illustration of the distinction between information and definition was given: an information item asked what the person is called who flies an airplane; a parallel definition item asked a definition of "pilot." The experience questionnaire related to content that young children might have had as a result of travel or mass media communication.

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[1] Dorothy J. Mugge, "Precocity of Today's Young Children: Real or Wishful?", Social Education, December 1963, pp. 436-439

According to the investigator, results on the four parts were as follows:

	Approximate % of correct responses of average child
Information	33
Content beyond immediate environment	33
Definition	50

There was also a significant relationship between the variety of previous experiences and the information score. There were also, however, many misconceptions and gaps in the information of children.

The investigator, as one might surmise from the title of the article and selected citations, tended to emphasize shortcomings of children's knowledge. She summarized the results of the information test as indicating the following tendencies: "a lack of precision in the children's answers; an inability to keep two factors in mind at one time; difficulty in responding to the key word in a question; and little grasp of time and place concepts." This reviewer might note that similar comments might be made about information responses on the college level--it is a matter of degree.

One might also question the relevancy of certain of the questions. For example, she says, "On the topic of the post office, very few children could tell how much a regular stamp costs, why a stamp is cancelled, or the length of time a postman works each day." The reviewer would question the pertinency of such discrete information about the post office. The investigator also points out that second graders did not know the hierarchical relationship of city, county, state, and confused nomenclature. Other similar comments are made.

The investigator makes some pertinent comments with respect to travel and television. She found that on separating media from travel experiences, that only media was significant at the .01 level in relation to information. Her conclusion, reached by empirical observation before techniques of statistical analysis became available, is that travel experiences per se are not necessarily significant, and that when not accompanied by appropriate verbalization are not translated into information.

The investigator reminds exponents of the contribution of television that the favorite program of the majority of seven-year olds interviewed was of a cartoon nature. The reviewer shares her pessimism about the value of such programs, but he is not willing to dismiss "worthwhile programs" merely because "inadequate explanations may have limited their value." After all, the investigator did find that there was a significant relationship at the .01 level between media and social studies information.

One of her most pertinent observations is the fact that there was a significant relationship at the .01 level between high scores on information and after school library attendance. She comments that the factor of going to the library may not be important but that "it may connote much about the interests and values of the families who had provided their children with this opportunity." She also noted that there was a "dearth of knowledge about the farm." What Mugge and other writers fail to do is to set up a theoretical framework in which to ask questions, therefore, all they can offer is a post-facto interpretation of why children do not know certain information. Why should children today know much about the farm? It is no longer a significant part of the cultural experience of children or adults.

The investigator points out that responses to definition questions are much higher than to information questions, and indicates that "the definitions were considered correct even if they represented only vague synonyms, minor uses, or rather unimportant attributes." She explains such liberal scoring gives a positive skewness to such tests in contrast with those which give a definition and require a precise term.

Mugge's article has been reported at some length, because she raised some interesting questions and, moreover, has been one of the few investigators to challenge the general assumption that today's children can learn more, on the basis of previous knowledge.

Her final conclusions, in an oversimplified manner, are that some children can and some children can't learn more earlier, and that a major school task is that of aiding children develop adequate systems of categorization. This definition of school task is consistent with the greater emphasis on organized learning. Basically the investigator, however, de-emphasizes the significance of information acquisition in the social studies program in her negative comments about the social studies as a purveyor of knowledge. The investigator's view of the child and education might be described as romantic, since she not only appeals twice to poetry, but concludes a research report with a non-research appeal.[1] But this is what people in education so often do--when the facts do not fit their preconceptions of the education of children, they find another advocate.

Summary of Knowledge Before Instruction. A number of questions can be raised about the methodological exactness of the research undertaken to appraise knowledge of young children in social studies prior to instruction. Some of these questions relate to the nature of the sample, content of the instruments constructed and used, methods of test administration, and statistical analysis. Questions can also be raised about the bias of the investigator, which ranges from unsympathetic to enthusiastic about the idea of stepping up instruction for younger children. Notwithstanding these questions, the studies on the whole substantiate the premise that children have knowledge and interests in social studies prior to instruction, a premise previously documented.[1]

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[1] Alistair Reid, "A Poet's View of Childhood," The Atlantic Monthly, March, 1963, p. 104.

The studies suggest that different approaches may be taken to upgrade the content of elementary social studies instruction and to change what has become, to borrow Bagehot's classic phrase, "a cake of custom."

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[1] See in particular C. A. Probst, "A General Information Test for Kindergarten Children," Child Development, 1931, pp. 81-95, and M. C. Templin, "General Information of Kindergarten Children: A Comparison with the Probst Study After 26 Years," Child Development, 1958, pp.87-96.

Knowledge After Instruction

Several studies have been conducted to investigate the hypothesis that children can learn more social studies content earlier. "More" in this context has several meanings, and does not imply a quantitative as much as it does a qualitative difference. Content variables include an increase in the level of abstraction or categorization, either by the presentation of new materials or the reduction in age-grade placement of conventional materials; systematic instruction in aspects included, but not emphasized, in traditional curricula; or the presentation of materials which are normally not assumed to be within the intellectual command of children at a given age. Methodological variables have also been related to content, but have been subordinated to content. These studies accept the hypothesis that children can learn more earlier.

Special test results relating to intelligence quotient and reading ability merely confirm that brighter children and children who have higher levels of reading ability test higher on both pre-tests and post-tests, both in experimental and control groups. Many of the studies report different scores based on sex. These results are not included in this review because they are not relevant to the main issue. Furthermore, analysis of test results by sex appear to serve no more useful purpose than to give an additional opportunity to run correlations, since no investigator has hypothesized different curricula, methods, or sex grouping.

None of the studies questions the premise that the level of instruction should be decreased or questions, ex-post facto, hypotheses or methods of procedure, whether relating to content, presentation, or evaluation.

Of the twelve studies reported in some detail, two are not research studies, but merely descriptions of curricula. One of these relate to Senesh's organic curriculum in economic education and the other to Chace's description of first grade geography activities. Both indicate kinds of programs with which success has been reported, even though there is no statistical analysis available.

Grade placement of these studies were: kindergarten, 1; Grade 1, 2; Grade 2, 1; Grade 3, 2; Grade 4, 1; Grade 5, 2; Grade 6, 2; Grade 7, 1; and Grade 8, 1. By content, one dealt with anthropology; 1, economics; 5, geography; 1, history (chronology); 2, political science; and 2, social science. The anthropology and economic curriculum projects are continuing projects. Most of the research studies dealing with knowledge after instruction, like those dealing with knowledge before instruction, are one-time investigations.

Social Science Concepts, Kindergarten. Spodek[1] sought to study the implications of a spiral concept approach to teaching by developing a kindergarten unit "New York as a Harbor." He defined basic concepts as "those big ideas which unify a field of inquiry and give meaning to the various facts that are collected by scholars working within the field." His outline of concepts about New York as a harbor indicate that many were no more than factual-type statements. These concepts were later "broken down into more specific understandings" appropriate to the kindergarten level. These were not described so it is impossible to ascertain how the actual teaching content was constructed from the topical outline.

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[1] Bernard Spodek, "Developing Social Science Concepts in the Kindergarten," Social Education, May 1963, pp. 253-256.

The subjects consisted of 18 kindergarten children at the Agnes Russell Center, a service school of Teachers College, Columbia University. The program was presented in two week periods, separated by periods of similar length, but the total duration time of the interrupted unit was not specified. The evaluative instrument consisted of a test interview using pictures and models as stimulii. As a measure of control, items dealing with farm concepts were included and scored. In addition, an observer was always present and recorded behavior pertinent to the experimental program. These observations were broken down into learning episodes which were categorized chronologically and topically.

Test findings dealing with harbor content indicated a gain in concepts significant at the .01 per cent level. On the farm control items, there was no significant gain. From these score comparisons, it was inferred that changes in the experimental items were due to instruction and could not be attributed to chance or maturation.

The investigator concluded that kindergarten children can begin to develop significant social science concepts, and that this ability does not depend upon proximity or remoteness of the phenomena studied but rather upon the abstractness or concreteness of the phenomena. Other conclusions were that kindergarten children gather information from many sources, that they can deal with ideas over a long period of time, and that they transfer their understanding to new situations. The interrupted programming, which permitted repetition of an idea, aided learning. The conclusion that kindergarten children use the tools of the social scientist seems to unduly reflect the enthusiasm of the investigator. A three dimensional play map built to scale was the only example given in support of this conclusion.

The author recommends the development of new types of programs in kindergartens more closely related to the programs in the rest of the child's school career.

Anthropology, Concept of Culture, Grades 1 and 4. The Anthropology Curriculum Project at the University of Georgia[1] is based on the premise that children at any age can learn content related to any discipline, provided the content is adjusted to the maturity of the learner. The objective is not to merely test the capacity of children to learn new material at a single grade level, but to construct a series of instructional units, a month duration in length, specifically based on the content of anthropology which can be introduced as a part of any on-going social studies program in Grades 1 through 7. At the end of the five year period, some of the children, both experimental and control, will have been exposed to several years of anthropology and it will be possible to ascertain the extent to which particular children show increasing skills of anthropological conceptualization. This longitudinal aspect is a common element with Senesh's economics project at Elkhart, Indiana; another common element is the emphasis on the scientific terminology and abstractions of the discipline.

The major hypothesis, implicit in the rationale of the project, is that student achievement in a structured subject approach gives greater increments in learning, as measured by standarized tests, than the fused approach to social studies instruction, pupil and teacher competency held constant. This hypothesis, however, is not subject to experimental verification within the project, since it is not the purpose to prepare subject versus fused types of instructional material in anthropology, but merely subject organized material in anthropology which may be added as a unit in the existing curriculum.

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[1] Prepared for this review by Marion J. Rice, Project Coordinator, Anthropology Curriculum Project, University of Georgia.

The fact that the University of Georgia Anthropology Curriculum Project is in one social science, whereas the fused curriculum prevalent in elementary social studies draws upon several social sciences, precludes the experimental testing of hypotheses relating to social studies instruction. The major evaluation effort therefore is to prepare valid and reliable pre-and post-test measures of achievement in anthropology and to ascertain the extent to which children can actually learn anthropology. If the children can learn scientific anthropology, it is predicted that the project will substantiate the premise that many justifications advanced in support of existing studies program are without pedagogical foundation.

Over fourteen schools, all in Georgia, constitute the experimental schools, although replication studies are now being conducted in New England, Mid-Western, and Western States. In each of the experimental schools, there is an experimental class and a control class by grade level. The experimental class is taught by the regular classroom teacher who has received an intensive six-week course in anthropology; the control teacher has had no training in anthropology. Students and teachers in both experimental and control classes use the same materials prepared by the project. The significant difference in experimental and control classes is therefore instruction by teachers trained in anthropology versus instruction by teachers untrained in anthropology. This training differential leads to the hypothesis that there is no statistically significant difference in student achievement in social studies or anthropology as measured by standardized social studies tests or anthropology achievement tests between experimental pupils taught by trained versus control pupils taught by untrained teachers. These hypotheses permit an examination of the useability of project material by teachers untrained in anthropology. This point is not found in any of the other research studies. It is considered significant because, from a practical standpoint, few elementary teachers will ever have systematic instruction in anthropology. The useability of instructional material, independent of the level of teacher preparation, is thus important, to curriculum innovation.

Material is developed in a primary and intermediate cycle. The unifying theme for Grades 1 and 4 is "The Concept of Culture;" Grades 3 and 6, "Cultural Dynamics;" and Grade 7, "Life Cycle." The intermediate cycle is not merely an expanded version of the primary cycle, but involves a higher and more abstract level of conceptualization as well as differentiated learning material. At the first grade level the unit was primarily developed through three ethnographies, for the Arunta, Kazak, and Americans. The fourth grade unit was developed topically and ethnographic material was structured comparatively. Grade 2 and 5 materials are likewise developed differently--Grade 2 material deals primarily with New World Archaeology and Prehistory, whereas Grade 5 materials draws on Old World Archaeology and Prehistory.

The project has completed its first year of field testing and is preparing material for field testing at Grade 2-5 levels in early Spring 1966. All experimental and control teachers will continue teaching in the project during its duration, but it is anticipated that there will be some replacements due to teacher shifts.

Evaluation instruments of the project in the first year of field testing consist of the Sequential Test of Educational Development, Social

Studies, Intermediate, Forma A and B; project constructed achievement tests in anthropology, Grade 1 Level, Form A and B, and Grade 4 Level, Form A and B; teacher evaluation logs; and a teacher feedback conference. Alternate forms of both the standarized and anthropology tests were used as pre- and post-tests.

The Grade 1 anthropology test consists of a 15 item, four distractor, multiple choice picture test, and is designed to measure general concepts rather than specific factual achievement. The Grade 4 anthropology test consists of a thrity item, four distractor verbal multiple choice test, also emphasizing concepts rather than factual information.

The first year evaluation indicated the following, with respect to anthropology achievement. Pre-test Grade 1 scores on 875 first graders, experimental and control, gave a mean response of 6.6, a mean pre-test correct response of 44 per cent. Post-test scores indicated a mean gain of 2.1 and 14 per cent for control classes. Pre-test Grade 4 scores on 802 fourth graders gave a mean score of 9.3, a mean pre-test correct response of 31 per cent. Post-test scores indicated a gain of 4.45 or 15 per cent for experimental classes compared to a gain of 4.15 or gain of 14 per cent for control classes.[1] The present tests yielded reliability coefficients of .79, .72, .80, and .84 for Anthropology Test Forms 1A, 1B, 4A, and 4B respectively. The tests are now being revised on the basis of item analysis.

Statistical analyses included analyses of variance and co-variance, product-moment correlation, and tests of the significance of differences between means.[2]

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[1] Data supplied by Dr. Warren G. Findley from Anthropology Curriculum Project files.

[2] William W. Greene, Jr., "Evaluation of the Anthropology Curriculum Project for Grades 1 and 4 as Measured by Selected and Prepared Testing Instruments," A Panel Report on the Anthropology Curriculum Project, University of Georgia, National Council of Social Studies, November 27, 1965, (General Information Series No. 4, Anthropology Curriculum Project, University of Georgia, Athens, November 1965).

Tests of the significance between the means of the pre- and post-test scores were found to be significant at the .01 level on the anthropology tests but not on the STEP Social Studies tests.

On the basis of the first field test and analysis of test results, the evaluator concluded that "The subject matter of anthropology, as presented in this curriculum, can be taught at grade levels one and four, as revealed by the significance of the gains made in pupil scores on the Anthropology Tests." Other conclusions were that the non-significance of gains made in STEP social studies scores simply reflected the lack of anthropological subject matter content in the existing social studies curricula. Pupils scoring high in social studies, however, also tended toscore the highest gains in anthropology. In item analysis, the gains in percentages answering test items correctly in Grade One tended to definitely favor the experimental group, i.e., those taught by teachers having training in anthropology. The lesser differentiation between the groups in Grade Four could possibly be explained by the inclusion of pupil texts in the curriculum materials.

Teacher feed-back at the evaluation conference indicated the need for more testing on the factual material covered by the Grade 1 and Grade 4 anthropology units. Teachers expressed the view that the gains made in instruction as measured by post-tests did not sufficiently test the depth and scope of learning in anthropology. Fourth grade teachers also recommended that the chapter "Culture Dynamics" in the fourth grade unit made the conceptual in-put too demanding for the fourth grade level. This confirmed the observation of the Project Coordinator, who taught the fourth grade unit to a fourth grade class, that the fourth grade unit was too difficult. A decision has been made to delete the chapter in the fourth grade unit and thus permit more time to develop fewer concepts.

Teachers also indicated that they felt some attention should be given to vocabulary reduction; a problem which the Project has not yet solved. Teachers also indicated a desire for more visual material, which is being made available in the second field test year.

On the whole, teachers reported favorable teacher and pupil receptivity at both grade levels and expressed the view that the anthropology units were more stimulating than conventional social studies units. At the same time, they thought that the task expectancy by grade level was too high, both in amount of material and vocabulary expectancy. While the pupil fourth grade texts were written to be within less than a 4.0 reading level by the application of reading formulas, these formulas do not sufficiently reflect the difficulty of the learning task required by new technical vocabulary. By reducing the quantity of fourth grade material in the second year of field testing, and by extending the first grade unit from twenty to thirty in-put days, including testing time, it is believed that some of the difficulties reported by the cooperating teachers may be ameliorated.

Economic Concepts, Grade 1. The Purdue University Economics Curriculum Project, officially the Elkhart Experiment in Economic Education, is one of the better known primary curriculum efforts in the country, although there is a paucity of published evaluative material. Begun in 1958 by Lawrence Senesh, the program has attracted national attention because it has been one of the first to attempt to translate abstract principles of a social science into primary teaching materials, without the over-simplification and distortion found in many text books and units of study. Science Research Associates have published materials for Grade 1.[1]

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[1] Lawrence Senesh, Our Working World: Families at Work and Resource Unit (Chicago: Science Research Associates, Inc., 1964).

The Resource Unit (teacher manual) for Families at Work gives an overview of the program, presents the basic premises of the project, and gives a chart showing the fundamental idea relationships of economic knowledge. While generally referred to as an economic curriculum, Senesh conceives of his curriculum as a complete social studies program. According to Senesh, "It is because economics plays so large a role in the child's world, and because it will continue to be so important all his adult life, that it has been made the core of Our Working World. The other social sciences . . . are . . . an integral part of the program." The purpose of the curriculum is to introduce children "to the fundamental principles underlying the functioning of our social world and to relate children's experiences to these principles." "Organic curriculum" is the term which Senesh applies to his program. This term has been used in a variety of contexts, but as used by Senesh it appears to apply to taking the ideas of the social sciences and relating them to the experiences which children have. It therefore seeks to capitalize both upon scientific content and the expanding interests of children as they move up in age-grade placement. The theoretical hypothesis of Senesh is that "children's experiences are potentially so meaningful that the fundamental ideas of the social sciences can be related to them on every grade level."

In addition to the actual materials, non-technical descriptions of the project have been given by Senesh[1] and by McAllister[2], director of elementary education in the Elkhart Public Schools who worked with teachers to implement the experiment.

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[1] Lawrence Senesh, "The Economic World of the Child," Instructor, March 1963, pp. 77-79.

[2] A. R. McAllister, "Economic Education: A New Horizon," Instructor, January 1964, p. 7.

Government, Grades 2, 3, 4. In a study conducted by Arnoff[1] in seven of Springfield, Ohio's twenty-three schools, twenty-one experienced and certified teachers, one in each school at each grade level, taught a five-week experimental "unit on Government." Tested intelligence of children ranged from 68 to 154 and socio-economic ratings of the experimental population ranged from middle-lower to upper middle class. Content of the unit included many concepts, terms, relationships and topics not usually introduced in elementary social studies, with some material suggested by governmental topics in the upper elementary grades. The instructional period coincided with the off-year election of November 1962.

Pre-test findings indicated that "no less than 75 per cent of the children in the studies at all three grade levels had a basic concept of such terms as fire chief, highway patrol, law, trial, and several other terms before instruction. . . . The post-instructional test indicated that more than 75 per cent of the children at each grade level had learned the meaning of city manager, property tax, levy, president, mind, congressman, subpoena, ballot, split ticket, campaign, and 19 other terms of government" The testing procedure was oral administration of a three-choice multiple test, in which alternative definitions or functions of government were presented. Other findings were: that children in grade 2 knew almost the same amount of information as children in grade 3, that children in grades 2 and 3 acquired new knowledge of about the same number of terms and that children in each of the grades gained increasing amounts of information notwithstanding the fact that no grade showed any tendency to learn more readily than any other. According to Arnoff, the study "has documented the ability of children to handle much more complex and abstract social studies content" and shows that "the perspective of elementary school children can increase rapidly in a rich instructional environment . . ."

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[1] Melvin Arnoff, "Adding Depth to the Elementary Social Studies," Social Education, October 1964, pp. 335-336.

This study of Arnoff did not use a control group, and may therefore be described as quasi-experimental rather than experimental. The lack of a control group and the use of an achievement test geared to the instruction this group may have been receiving in the five-week period devoted to the experimental unit leaves unanswered the question of alternate increments of learning which could have taken place during the period. In assessing the results of similar research findings, this will be found as a recurrent objection to the research design.

Geography, Map Skills, Grade 3. Chace[1] describes a Cape Cod third grade class in which, through systematic initial introduction to the natural environment and follow-up activities, third graders learned to: use map keys and symbols; recognize, read, and make relief maps; understand and use phsiographic terms; use symbols and graphs to record weather; distinguish between relief, political, and special maps; locate directions from the cardinal points; locate and follow map routes; draw maps from dictation, copying, and by use of realia; recognize space relationships and compare size according to maps used; and distinguish between various political units. The time in-put is not specified, but it is clear that the method uses coincides with the time honored Pestalozzi-Ritter principles of teaching geography, i.e., to first make the landscape concrete by the senses. While there are no test results and no comparison with other classes, it describes what can be achieved in geography at early grade levels through planned instruction. It reflects instruction that was earlier considered, as in the mid-nineteenth century Guyot geography texts, within the abilities of primary children.

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[1] Harriet Chace, "Map Skills at the Third Grade Level," Social Education, January 1956, pp. 13-14.

Geography, Deck Map Learning, Grade 4. McAulay[1] conducted a study to ascertain increases in geographic understanding in which incidental use was made of map work as compared with systematic instruction in map use.

His sample consisted of two rural fourth grade classes in rural central Pennsylvania. Class A, the control class, consisted of 38 children with a mean IQ of 114. Class B, the experimental class, consisted of 36 children with a mean IQ of 112.

The same unit on Pennsylvania was used in both classes, and had the same objectives. Differences in instruction were as follows: Class A was provided with an "enriched" social studies invironment but there was no systematic use of desk maps. Class B was provided with fewer social studies materials about Pennsylvania, but commercial maps were used extensively, and children used the Nystrom Series of Desk Maps No. DD 137 to complete a minimum of 12 maps involving direction, state location, physical features, climate, topography, industry, depressed areas, latitude and longitude, and four historical maps--Indian tribes, colonial settlement, Revolutionary War, Civil War.

Evaluation instruments consisted of the geographic understanding sections of the California Social Studies II test, Form AA which was used as a pre-test and Form BB as a post-test. Three investigator constructed post-tests were also used, one to test Pennsylvania place information, a second to evaluate general knowledge about Pennsylvania, and a third to evaluate map interpretation to gain information.

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[1] J. D. McAulay, "Map Learnings in the Fourth Grade," Journal of Geography, March 1964, pp. 123-127.

On the California social studies test there was an insignificant gain in geographic learning for the control class but a very significant increase for the experimental class. On the three other tests, the experimental class also achieved scores significantly greater than did the children in the control class. Grading of the individual maps completed by the experimental students also showed a considerable improvement in map expertise, the class mean score increasing from 1.7 to 2.8 on a 4-point scale.

The investigator concluded that maps "can be a productive instrument in the understanding of social studies" and that "map skills can be taught in connection with on-going social studies unit" and "need not be taught as separate entities." The latter conclusion is certainly a non-sequitur, since the results of the study indicate the superiority of systematic map instruction. Map skills are generally taught as skills related to some on-going element of instruction, in which map usage is merely an additional element. Perhaps there is a semantic difference in the implication of separate.

The investigator's two questions were poorly stated from the standpoint of the investigation. The two questions were: "Can fourth grade children understand social studies content more effectively through the use of maps rather than through the use of reading materials." This question was not experimentally investigated. There was no attempt to provide systematic reading material for use in Classroom A to parallel each map exercise. The second question was "Can particular map skills be assimilated in conjunction and association with a social studies unit?" It will be noted that, unlike the previous question, there is no comparative element, and becomes a merely unquantified descriptive question, which, given instruction, indicates an affirmative answer before investigation. All that the study really shows is that where children are given instruction in map usage, as compared with children who are not given instruction in map usage, a test of geographic understanding involving map usage will favor those who had map instruction. Students in a captive school situation, predisposed to authority adjustment, normally indicate a predisposition to be interested in whatever they are exposed to. Thus to say that children required to do map work appear to enjoy map work is no more meaningful than stating that children who are taken to a zoo enjoy going to the zoo.

Geography, Map Learning, Overlay Projecturals, Crade 5. Arnsdorf[1] conducted a study, similar to the McAulay study, to ascertain the effect of systematic instruction on the improvement of geographic understanding and relationships. The subjects consisted of 234 fifth grade children from ten classrooms located in an urban community with a mean intelligence score of 113.5 on the California Mental Maturity Test and a mean reading level of 6-8 on the California Achievement Test. There were no control groups, but the subjects from six classrooms were instructed in one combined group; each of the four other classrooms was taught as a separate unit.

The pre- and post-test evaluative instrument consisted of the Iowa Tests of Basic Skills, which gave separate scores for map-reading, graphs and tables, and references. In addition, an investigator constructed two-part geography test, consisting of 20 items each, was administered as a post-test only. Part I of the test, accompanied by a relief-like physical desk map of the United States, was designed to measure map interpretation ability; Part II was a four-distractor multiple choice test constructed to measure map geographic understanding and relationships.

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[1] Val E. Arnsdorf, "Teaching Map-Reading and Geographic Understanding with Projecturals," The Journal of Geography, February, 1964, pp. 75-81.

The content consisted of thirteen specially constructed overlay projecturals selected from fifth grade social studies content, and twelve lessons, approximately one hour each, conducted twice a week over a six week period. Map titles were: United States outline, state boundaries, mountains, railways, manufacturing, mineral resources, physiographic regions, river systems, land use, growing seasons, precipitation, vegetation, and population. The verbal content of the lesson was designed to develop an understanding of what was included in the overlay, distributional characteristics, and relationships that might exist between the feature and further distributions. The method of presentation is described as "inquiry-discovery" but there appears to be no justification for the use of this label.

The investigator found that gains in means on the post-test for the three work study skills over the pre-test were significant at the .01 level. The investigator's interpretation of these results is ambiguous. In the discussion he describes as "problematical" whether these gains can be attributed to the instruction program, but in his conclusion states that such a program "accelerates pupil growth in map skills and geographic understandings." He also includes as a conclusion the gratuitous observation "Interest in geography as a social science is stimulated when children are given continued encouragement to raise questions and explore relationships." There was no measure of interest. On a similar level is the unwarranted conclusion that "an inquiry-discovery approach helped the learners achieve better progress in the social studies." Since there were no controls, there could be no comparison of progress.

Organizationally, an interesting test result was that achievement in the large group made-up of six classes equalled or surpassed that in the self-contained classroom on two scores--work study skills and geographic understanding. This finding suggests that the actual method of presentation was lecture-discussion rather than inquiry-discover, and that further explorations might be made as to the relationship of class size to teaching.

At best, this study might be characterized as quasi-experimental. As a media study, it is defective because it does not clearly show how overlay projecturals accompanied by presentation-discussion differ from flat maps and expository text. It should also be noted that in the McAulay fourth grade map learning study, the conventional desk map was used and the investigator reported similarly gratifying results. The Arnsdorf projectural study differed from the McAulay study, however, in an important respect. Arnsdorf was systematically teaching map skills in isolation to social studies content, whereas map usage in the McAulay study was part of the unit of Pennsylvania. The McAulay study utilized a control group which did not use desk map assignments as a part of the unit, and therefore was able to compare the performance of two groups in which there was a definite content variable.

Geography, Time Zones, Grades 4, 5, 6. This study of Davis[1] examines the assumption that teaching about time zones should be delayed until grades six or above. The subjects consisted of two fourth grade, two fifth grade, and two sixth grade classes from six different Davidson County, Tennessee elementary schools. At each grade level, there were experimental and control classes. At the beginning of the experiment, there were no significant differencies in the experimental and control groups and by grade level with regard to intelligence, social studies achievement, and understanding about time zones.

The instruments used were the Lorge-Thorndike Intelligence Test, Level 3, Form B, Non-verbal, and the Sequential Tests of Educational Progress, Social Studies, Form 4A, administered as pre-tests. The time zone test was an investigator constructed criterion test composed of forty-six items related to direction, earth rotation, clock time, International Date Line, and standard time zones in the United States and the world. This test was administered as a pre-test, post-test, and one-month delayed recall.

The experimental content consisted of 14-day, 30-minute period units specifically embodying material relating to the development of an understanding of geographic time zones. The control teachers gave their classes no instruction in time zone concepts except that which was embodied in the regular course of study.

Findings on the criterion test indicate that the experimental classes performed significantly better at each grade level than did the control classes on both the immediate and delayed recall tests. Gaines were not significant between fourth and fifth and fifth and sixth grades, but fourth grades indicated a significant gain over sixth grades. This gain, according to the investigator, may have been due to the limitations of the criterion test. The gain may have been spurious, but since the pre-test showed that sixth graders already knew more than fourth graders, and fourth graders received the same content in-put as the sixth graders, fourth graders had an opportunity to benefit more from instruction than sixth graders. When the learning task is not increased proportionately to base knowledge in the area, increments of learning will not be proportionately as great.

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[1] O. L. Davis, "Learning About Time Zones in Grades Four, Five, and Six," Journal of Experimental Education, Summer 1963, pp. 407-412.

The investigator concluded that "Firm and substantial beginnings can be made in the development of geographic time and space concepts as early as the fourth grade." He also questions the appropriateness of deferred instruction about other concepts in the social studies.

Geography, generalizations, Mexico, Grade 6. The Greenblatt[1] study departed from the usual emphasis on map usage and sought to determine the degree to which sixth grade children could form generalizations pertaining to the geography of Mexico. The generalizations were drawn from a college textbook. Nothing is more vague and diffuse in social studies literature than "generalizations," and the report has little utility since no definition of generalization was given nor were there any illustrations. Frequently generalizations are no more than factual statements, or fairly low level statements which imply a knowledge of factual content. Translating generalizations from a college text is in itself no guarantee of their level of sophistication.

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[1] Edward L. Greenblatt, "An Exploratory Study of the Development of Selected Generalizations in Social Studies," Dissertation Abstracts, March 1964, p. 3640.

The subjects consisted of eight sixth grade classes, four experimental and four control. The content variable of the experimental classes consisted of major geographical generalizations with content selected from a college text. The control classes followed the "usual" social studies unit on Mexico.

Evaluative instruments consisted of geography achievement tests, tape-recorded interviews, and tape-recorded class discussions at two-week intervals. There were two investigator constructed tests, a fifty-three item multiple choice test of factual knowledge of the geography of Mexico, and a sixty-item multiple choice test of geographic generalizations. The interviews were conducted with 46 matched pairs to whom pictures were presented about which questions were asked about generalizations under study. The class discussions were based on a series of four questions.

Findings of the study, as might be expected, significantly favored the experimental group on the post tests of geographic knowledge and understanding of generalizations, on the tape recorded interviews, and the class discussions.

Conclusions pertaining to the implied hypothesis were that sixth grade children can learn more facts and form broader understandings than usually expected and that there is a relationship between factual knowledge and generalizing ability. Other conclusions were that teachers typically offer students few opportunities to generalize; that social studies units organized on the basis of expanding communities of men or basic human activities are not sufficiently challenging; and that subject knowledge and understanding of learning processes by teachers encourage pupil exploration of concepts and generalizations.

One of the recommendations of the investigator, in common with similar studies, was that the content of the social studies should be broadened and extended.

Historical Chronology, Ancient, Grade 6. Arnsdorf[1] conducted an investigation to ascertain the effect of instruction to accelerate development of time concepts as employed in the social studies, in contrast to development depending on maturation.

The subjects consisted of 563 sixth grade students drawn from a midwestern school system, divided into experimental and control groups. Experimental and controls were closely comparable on the basis of intelligence as measured by the Lorge-Thorndike Intelligence Test, Non-Verbal Battery, Level III, and the Iowa Every-Pupil Test B, Basic Work Study Skills.

Both experimental and control groups studied the same seven-week unit on "Ancient Civilizations." The experimental group was given three types of special chronological assistance: identification of, and instruction in, every term in the unit relating to time; use of various time-lines and charts to visualize time concepts; and the writing of biographical and autobiographical sketches to stimulate interest in past and present events.

Evaluation instruments consisted of: pre- and post- administration of Iowa Study Skills Test, Gates Survey Reading Test, and an investigator constructed pre- and post-test relating to historical time which consisted of six sub-tests--chronological vocabulary, four-event ordering without dates, two-event ordering without dates, time relativity, four-event ordering with dates, and time absurdities. The items included were drawn from information found in a variety of sources available to pupils in the intermediate grades. While there were variations in the consistency of these measures, they did differentiate fairly well some various ways of measuring understanding of historical time. The effects of the differentiated programs of instruction were measured principally with respect to gains in basic study skills (Iowa Study Skills Test) and to gains in time understanding (original test). No single score was computed for understanding of time and historical chronology and the gains on each of the six subtests were treated separately.

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[1] Val E. Arnsdorf, "An Investigation of the Teaching of Chronology in the Sixth Grade, Journal of Experimental Education, March 1961, pp. 307-313.

No significant differences in the increase in basic study skills resulted from differentiated instruction whether the comparisons were based on the test scores alone or when controlled for initial test scores, reading comprehension scores, and both scores. The specialized instruction designed to increase the ability to deal with time concepts thus had no measurable impact upon study skills as such.

The test of sub-abilities in understanding historical time indicated marked success in the experimental group with respect to: (a) historical vocabulary; (b) time relativity; (c) four-event ordering with dates; and (d) time absurdities. In the case of two-event ordering without dates, the experimental subjects surpassed the control subjects only when there was no control, except differentiated instruction, and when reading comprehension was statistically controlled.

In discussing these results, Arnsdorf commented that where there is specific instruction in dealing with historical time an increase in work study skills, as measured by a test such as the Iowa test, should not be expected. This conclusion is one which is consistent with a priori inspection. If a particular test used as a pre- and post-test does not include a sufficient number of items relating to the content of differentiated instruction, it is impossible for that test to reveal any differences between experimental and control groups. Similar results were found by the Anthropology Curriculum Project at the University of Georgia with the use of a standardized test.

The investigator, with respect to the difficulties experienced with undated time-event ordering observed "Why the instruction on the understanding of time given to the experimental group produced no effects at this point is not known." The literature on time-event ordering has always indicated that pupils and adults learn more easily a specific rather than an approximate date, and that undated time event ordering requires a knowledge of key dates. As Wesley has pointed out, "approximate dates are not valueless, but they gain reality only when they are enclosed within the limits of definite dates."[1]

Arnsdorf thus rejects the 1940 conclusion of Pistor[2] that time concepts are the product of maturation rather than of instruction, and joins many earlier writers who have called for systematic instruction in developing an understanding of time and chronology.[3]

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[1] Edgar Bruce Wesley, Teaching Social Studies in Elementary Schools, (Rev. ed.; Boston; D. C. Heath, 1952), p. 305.

[2] Frederick Pistor, "How Time Concepts are Acquired by Children," Educational Method, November 1940, pp. 107-112.

[3] Henry Johnson, Teaching of History (Rev. ed., New York: Macmillan 1940), Chapter X, "Teaching Chronology;" Kopple C. Friedman, "The Growth of Time Concepts," Social Education, January 1944, pp. 29-31.

Social Science, Generalizations, Grades 6. Another generalization study at the sixth grade level is that of Beaubier,[1] in which he sought the extent to which sixth grade children learned three social science generalizations. As with the Greenblatt study, there was no definition or no description of the three generalizations nor was there a definition of optimum conditions.

The subjects consisted of 228 pupils from eight sixth-grade classes in a middle-class Southern California school district. The subjects were equally divided into experimental and control sections. The experimental material consisted of content of greater complexity than was ordinarily taught. The control group followed the regular program in social studies. The time in-put was eight weeks. Data were gathered by the use of pretests, posttests, and individual tape-recorded interviews. The content of the evaluative instruments was not specified.

It was found that no significant differences were found between experimental and control groups on the pre-tests, but that on the post-tests and on the interviews gains favored in all cases the experimental group, two of which were significant at the .01 level on tests and in all three areas on the interviews. Differences were greater in economics and anthropology. Interview responses favored boys; tests favored girls.

The investigator included the usual recommendation concerning increasing the breadth and depth of social studies.

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[1] Edward W. Beaubier, "Capacity of Sixth Grade Children to Understand Social Science Generalizations," Dissertation Abstracts, January, 1963, pp. 2439-2440.

Public Controversy and Conceptualization, Grades 7-8. The Harvard Social Studies Project[1] was concerned with the development of curriculum materials which could be used to encourage student consideration and reflective thinking about societal issues within the framework of a seventh and eighth grade U. S. history course. Two styles of teaching, one "Socratic" and one "recitation," were used in the experimental classes. Since the Harvard Project looks toward the projection of such material upward into the high school rather than downward, it is reported only briefly here.

The experimental subjects, taught by four cooperating project teachers, consisted of five classes of students as they moved through the seventh and eighth grades of one junior high school in a suburban community, almost half of which were composed of families of managerial, professional, and technical positions. Control classes from two similar suburban junior high schools were used, one outside of Boston and another on Long Island.

The project procedure was to devote about one-third of experimental student time to conventional U.S. history and one-half to the experimental materials. About eight weeks were consumed in extensive testing.

Evaluation instruments to measure reflective thinking consisted of the Watson-Glaser Critical Thinking Appraisal, the Michigan Test of Problem Solving, Iowa Test of Educational Development No. 5, and project developed paper-pencil tests testing dialogues which were tape recorded and analyzed to evaluate the ability of students to use concepts of the project's critical-thinking scheme.

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[1] Donald W. Oliver and James P. Shaver, The Analysis of Public Controversy: A Study in Citizenship Education. (A report to the U.S. Office of Education. Cambridge, Mass.: The Laboratory for Research in Instruction, Harvard Graduate School of Education, 1963); James P. Shaver and Donald Oliver, "Teaching Students to Analyze Public Controversy: A Curriculum Project Report," Social Education, April, 1964, pp. 191-194, 248.

Evaluation instruments to test conventional social studies content consisted of the Iowa Test of Educational Development No. 1, Understanding Basic Social Concepts; the California Tests in Social and Related Sciences, Part I and II (an American History test), and the Principles of American Citizenship Test (developed by the Columbia University Citizenship Education Project).

A measure of interest in societal issues was modeled after the Columbia University Citizenship Education Project, and consisted of ranking newspaper article headings in sets of three according to reading interest. Two types of headings were used; one dealing with issues of national concern studied in the project, and one dealing with issues unrelated to the project. There was also a battery of personality tests administered.

Findings on the standardized tests of critical thinking indicated comparable gains in both experimental and control classes. The fact that experimental students did not exceed controls is explained by the fact that these tests are probably merely tests of general reasoning, a stable characteristic not apt to be affected by changes in curricular content. The content of the experimental curriculum did not place emphasis on intellectual operations required by these tests.

Results of the project test of critical thinking showed consistent differences favoring the experimental groups, although dialogue tests did not show as clear or striking differences as might be expected.

The standardized social studies test scores indicated that gains in the experimental group over the two-year period were as great as the control group. On the test of interest, controls showed a greater interest in "project" items than did the experimental students but the experimental students showed more interest in the unrelated items.

This result is explained on the basis of possible satiation of interest on the part of the experimental group and withdrawal from knowledge of the complexities involved.

On teaching styles, used in the experimental classes, one a probing Socratic and the other a recitation style, no differences in student gains were found on any of the measures used. This suggests that teaching style is less important than the conceptual framework of the content.

The personality tests showed few significant correlations between personality measures and measures of learning. Statistical analysis revealed interactions between teacher style and student personality, and suggests grouping on criteria other than intellectual scores.

In discussing these results, the investigators first of all caution against any tendency to generalize, first because of the difficulties inherent in curriculum evaluation and the nature of the experimental setting. Nevertheless, the investigators emphasize that the Project does demonstrate the possibility of introducing systematic examination of controversial issues to further complex analysis in conventional social studies programs without loss of understanding and knowledge measured by conventional tests.

Summary of Knowledge After Instruction. All of the research studies which used statistical analysis and control groups reported significant differences favoring experimental subjects on post-test scores over pre-test scores, as measured by the investigator constructed instrument. Only in the cases of two map studies, one by McAulay at Grade 4 and one by Arsndorf at Grade 5, did the experimental curriculum result in significant gains as measured by standardized social studies tests as well as the investigator constructed test. The content of the Arnsdorf study related directly to map skills on the Iowa Test of Basic Skills and the amount of specific map training given by McAulay may have been reflected in the map portions of the California Social Studies test. The specificity of the map studies with social studies understanding as measured by standardized tests suggests that only in the map area was there a sufficient number of questions on standardized tests for an experimental social studies program to affect.

In these evaluations, use of standardized achievement tests are not useful for measuring content gains. Where a standardized test does not include test items related to an experimental program, it can not measure the experimental program because the content of the experimental program is specific. Conversely, an investigator constructed test measures an experimental program, because test items are related to specific content. The investigator constructed test always shows significance in favor of the experimental group, simply because the test items are not related to content of the control group.

In most of the research discussed, the design conforms to Design 10 as described by Stanley and Campbell,[1] in which X^1 is the new curriculum and X^2 the old curriculum, and 0^1 and 0^2 are the pre- and post-tests measures applied to the subjects, the experimental test being instructed in the new curriculum and the control in the old. The reviewer is familiar with the design, since it is the original evaluation design for the Anthropology Curriculum Project at the University of Georgia, but he questions if it is truly an experimental design. The curriculum and test situation, described appear to be no more than descriptive studies in which children, confronted with a pre-determined learning task in a captive situation, learn the material. The specially developed tests are useful in stating how much of the new content children learn; the use of standarized tests confirm what may be established by *a priori* inspection, that in the absence of test items there can be no measurement of the experimental program. Thus, however refined the evaluation instruments, differences in achievement favoring experimental subjects merely confirms what has been anticipated, *i.e.*, that experimental subjects taught the new content would know more of the content than controls who were deprived of the stimuli.

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[1] Donald T. Campbell and Julian C. Stanley, "Experimental and Quasi-Experimental Designs for Research on Teaching," in N. L. Gage, editor, Handbook for Research on Teaching (Chicago: Rand McNally, 1962), pp. 171-246.

Hovlund and Lumsdaine[1] have pointed out with instructional media that an experiment which merely describes what results have taken place is not a true experiment from the standpoint of a scientific contribution to curriculum development. Experimentally, the design is no more than a descriptive research hypothesis. It merely permits the investigator to say if X_c then X_o, in which the first is the content and the second pupil achievement in the content. It does not lend itself to any generalizations about the superiority of the content over other content. However, at the present stage of curriculum development and evaluation there seems to be little else available with respect to content evaluation. Instead of more one-shot research studies, perhaps the most pressing need in curriculum development is a better evaluation design. In the resources now available for statistical analyses, we have apparently confused statistical expertise with experimentation.

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[1] A. A. Lumsdaine, "Instruments and Media of Instruction," in N. L. Gage, editor, *Handbook of Research on Teaching* (Chicago: Rand McNally, 1963), pp. 597-598.

Notwithstanding these limitations, the curriculum studies dealing with knowledge after instruction support the hypothesis that children can learn more earlier. Since social studies is only a part of the school program, the question is not answered as to *how much* more learning children could take across the board in all school subjects in a complete school program.

Needed Research in Social Studies Education. Most of the studies include the accepted phrase "but more research is needed." The usual type of research recommended is of a discrete, fragmentary nature, which lends itself to a doctoral exercise or a study for publication. This reviewer questions whether such research is cumulative. Initiated without any theoretical framework, the studies do not result in explicit directions for curriculum development.

In the judgement of this reviewer, however, there are three types of research which would be useful: the first is historical; the second is philosophical and analytical; and the third is complete, simultaneous planned program research in school systems.

Historical research is needed not only in social studies education, but in all other phases of the public school curriculum. In recent years, the ratio of historical to statistical research in education has decreased sharply, and, in general, neither students at the undergraduate nor graduate level nor educators look at educational problems in perspective of historical theory and practice. The result is that much so-called research explores no new practices or procedures, but under a different name replicates and confuses what has been previously ascertained.

Take, for example, the research relating to knowledge before instruction. Beginning with the premise that children bring to the social studies an undefined quantum of knowledge, the investigator constructs a test based on books representative of what a culture considers appropriate for a particular age group, and then conclude that the child already knows something of what is to be taught. The psychology of learning, as well as empirical observation, demonstrates that knowledge develops from knowledge. Herbart applied the name "apperceptive background" to the base of previous knowledge, and for many years this principle was a basic element in instructional methodology. An analysis of Senesh's approach indicates that, under the disguise of a new "organic curriculum," he is reviving certain Herbartian principles and using these to develop new materials. Perhaps no approach in the social studies or current pedagogy is more favored than concepts, structure, and critical thinking, all of which are found as the rationale in the introduction to Woodbridge's 1824 geography text.[1] All of the various map studies, past and more recent, add very little to what the Edgeworths said in 1815 about geographic understanding and map study.[2] Recommendations concerning making instruction concrete for young children, with the use of field experiences and visuals, is as old as Comenius.[1]

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[1] William Channing Woodbridge, A System of Universal Geography on the Principles of Comparison and Classification (Hartford, Mass.: Oliver D. Cooke and Sons, 1824), p. 1.

[2] Maria and Richard Lovell Edgeworth, Practical Education (Second American Edication, Boston: T. B. Wait & Sons, 1815), II, 33-34.

A sequential historical analysis of past and recent curriculum work is first needed so that curriculum research may ascertain precise points of departure. This historical analysis should apply the classificatory principles now being used in Education Retrieval Information Centers, so that overlapping taxonomy is clearly distinguished. It is the hypothesis of this reviewer that there are a limited number of curriculum alternatives, organizationally or methodologically, due to the generalizing nature of language, and that what are often regarded as differences are merely abstractions from a complete scheme, or different labels applied to the same curriculum phenomena. This historical analysis should not be restricted to social studies, but applied to all curriculum areas. Social studies are but one area of the curriculum, and at a given time one subject area may utilize one curricular taxonomy while another uses a different taxonomy to describe the same issues or procedures.

Historical research will not prescribe, any more than current statistical research, the nature of the curriculum, either from the standpoint of content or methodology. It would, however, permit curriculum choices to be made on better evidence than mere semantic differences.

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[1] John Amos Comenius, The School of Infancy (Chapel Hill, N. C.: The University of North Carolina Press, 1956).

Philosophical research. In a perceptive comment Bruner has observed that the task of improvement in American education is not so much one of technique, psychologically or technologically, as it is philosophical.[1] Educational choices, either applied or theoretical, reflect some explicit or implicit educational outlook. In the field of the social studies, the problem is not the lack of goals, but the very welter of goals, in which all are equal and none subordinate. Lists of social studies objectives are made all encompassing, and become synonymous with socialization and enculturation. Schooling loses a particular focus. Social engineering objectives are stated which are only obtainable in a closed society.

This reviewer does not believe that there is only one true educational philosophy, or even that some educational philosophies are "better" than others. He does subscribe to the view that there should be internal consistency between educational philosophy and practice. Certain difficulties in American education, he believes, result from what he calls piestic democratic philosophy which is not converted into school operational procedures. The result is a needlessly overriding sense of errors of omission and comission by teachers and educators, and research which does not improve school practice.

An example of internal consistency between philosophy and practice is given. It is the thesis of this reviewer that a school is a social institution which has been created to pursue a particular institutional function. That function is the systematic transmission of knowledge through verbal and quantitative symbol mastery. It is an aspect of enculturation, due to the demands posed by culture accumulation in literate societies, which has been entrusted to teacher specialists. Like any institution, schools have overlapping areas which necessarily cut across the functions of other institutions, because schooling is part of a total cultural process. The particular function, however, against which goals and objectives should be defined, is school instruction. In a school system where such a philosophy was practiced, we might naturally expect to find great emphasis upon instruction organized by subjects, a structured curriculum, deductive learning, and departmentalization. Research would be oriented toward the improvement of cognitive learning and teacher performance would be based on increments in pupil knowledge.

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[1] Jerome S. Bruner, "Learning and Thinking," Harvard Educational Review, 1959, pp. 184-192.

The direction of educational research, as well as the interpretation of education research, reflects the value configurations and assumptions relating to education at any given time. Philosophical research is needed to specify clearly and analytically the value framework of education. Theory is a necessary tool to illuminate research. In the absence of a comprehensive educational philosophy, much educational research becomes merely an exercise, more noteworthy for its statistical brilliance than for its contribution to school practice. Philosophical research, involving the efforts of curriculum specialists, research specialists, other practicitioners, psychologists, sociologists, anthropologists, historians and laymen under the probing coordination of philosophers in education is needed to present a theoretical frame in which comprehensive educational research can take place.

Program Research relates primarily to the scope and method of conducting educational research rather than to content. In scope, educational research should not be discrete and fragmentary, but relate to the entire program of the school. This means that organization, content, institutional setting, and methods of teaching brought together to instruct children must be the subject of research. For research purposes, the program may be divided into many facets or tasks, but the sum of the research over a given number of years must be designed to completely test innovations in each content area and at each grade level. Research on innovation in social studies, separate from innovation in other subjects, would give only partial information needed for planning and up-grading total school programs. Separate from concomitant research in other content areas, the research evidence could not be properly evaluated.

This program research should be applied to system-wide programs, except where pilot studies using small samples are needed for initial research. System program research permits planning school programs in terms of research needs, and simultaneously permits horizontal and vertical research with the same subjects. In this sense, horizontal relates to the program spread for a subject at a given time; vertical relates to the longitudinal sequence and adjustments as subjects change in age-grade placement. The population of the school system, or combination of school systems, should be sufficiently heterogeneous in aptitude and socio-economic backgrounds and of sufficient size to permit comparisons of program variables.

The conduct of such research requires long range planning. The organizational model is thus bureaucratic, and implies both a comprehensive research plan and a research team to accomplish the projected research. The research staff should be a full-time staff, with research tasks assigned on the basis of competencies to perform the needed innovation and field testing required by the master plan. The long range plan of program development and field testing should be internally consistent with the basic historical-philosophical rationale. This type of bureaucratic program-systems research would thus demonstrate what the results are in educational practice and achievement of a particular educational philosophy. It would not, any more than discrete research studies, demonstrate any normative superiority about educational philosophy and practices, which are matters of cultural values. It would merely demonstrate scientifically the results of determinate educational practices logically consistent with a prescribed set of educational-cultural values.

The bureaucratic system-program research model must command extensive research resources. It is beyond the research faculties of educational institutions and agencies as now constituted, and repudiates the model of individual professorial research in which an investigator conducts discrete research according to his particular interest. Without this kind of frontal, systematic, and long term research, it is believed that the results of educational research will continue to be inconclusive and contradictory.

This estimate of needed research coincides with certain specifications of needed research in the social studies growing out of the 1963 Sagamore Conference[1]. The philosophical base, suggested by this reviewer, conincides with the first category listed, which was "major expectations hoped for from the social studies." There is, however, a major difference. This reviewer proposes that there must be a more general philosophical survey, of which social studies specifications should form a part. Attempts to specify social studies expectations, apart from other facets of the school program usually end up in making them almost synonymous with the entire school program.

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[1] Roy A. Price, Editor, "Conference on Needed Research in the Teaching of the Social Studies", Sagamore Conference Center of Syracuse University, October 3-5, 1963 (Mimeographed.)

The third category named at the Sagamore Conference was "selection organization, and presentation of subject matter content". This category coincides with the reviewer's category of program research. Again, there is the important difference that this reviewer believes that social studies research should be conducted in connection with the total school program, and not in isolation, except for needed pilot studies.

This reviewer has not specified research in three other categories emerging from the Sagamore Conference--"psychological factors of learning, the intellectual and emotional climate in which the educative process functions, and teacher personality factors and their relationship to instructional competency". In the judgment of this reviewer, the need with respect to the psychology of learning is to convert the wealth of research available into methods and materials of instruction, and to evaluate this in an instructional context, not research into learning divorced from the school setting. The other categories specified in the Sagamore Conference are likewise not emphasized by the reviewer. The category of emotional school climate could, however, be investigated as part of the program variable, previously described. Personality research is not a high priority with the reviewer because this teacher variable does not appear to be susceptible to modification, either by teacher selection on the projected teacher market or by teacher training programs, and the evidence already available, as in the Ryan and similar studies, is that there is no ideal teacher personality but rather a continuum of teacher and pupil personalities which have a variety of statistical fits. The reviewer subscribes to departmentalization, beginning at the primary level, in part on the ground of empirical observation that no teacher should have to put up with a child all day that he can't tolerate, and, conversely, that no child should have to remain all day with a teacher he doesn't like. Perhaps in this area the application of school judgment would be more practical than trying to sort out all teacher and pupil variables, put them on punch cards, and getting a personality fit.

The Sagamore Report is nevertheless recommended as reading for those who desire a more general specification of needed research in the social studies.

Abstract of Research and Opinion Articles

by

Marion J. Rice and A. Timothy Warnock

Summary

Research and opinion articles present evidence, or express the view, that children have knowledge of, or interests in, social studies before instruction and can learn more social studies content than is customarily presented.

Knowledge Before Instruction

The major conclusion of research investigators concerned with knowledge before instruction is that children's knowledge and interests have been underestimated. As a result, they conclude that the present social studies curriculum is conceptually deficient and does not contribute as much as it might to the intellectual development of children. Only one investigator (16) gave a different interpretation to his findings.

Investigator constructed tests indicate second grade children's knowledge ranging from 33 per cent (16) to over 84 per cent of content (11) before instruction. Third-graders knew about 36 per cent (9). McAulay showed that second grade children had already acquired certain map abilities prior to formal instruction in map usage (14).

Other studies (1, 8, 15, 19, 20) also indicate that children from kindergarten up bring a significant amount of knowledge to the classroom at a particular age-grade level before systematic school instruction. Although studies in this group often neglect to establish or indicate the reliability and validity of criterion measures, the major trend seems to be substantiated.

The study of political socialization of Easton and Hess (8) is a large sample survey of children in Grades 2 through 8. It indicates that political attitudes are formed prior to instruction in government. The implication is that the elementary school years are more important than previously considered for citizenship training, both from the standpoint of knowledge and values.

Knowledge After Instruction

Investigators cite their studies as evidence that children can learn more, earlier. Six (2, 4, 6, 7, 13, 40) report the learning of more advanced concepts or procedures by children following experimental curricula than those following conventional curricula. Each of these six studies are carefully conducted with experimental and control groups, tests of criterion measures relating to validity and reliability, and careful statistical analysis with respect to variance and correlation.

Arnsdorf (2) demonstrated development in historical chronology; Beaubier (4), of social science generalizations; Davis (6), of time zones; and Greenblatt (7), of geographic generalizations. McAulay (13) showed improvement in social studies understanding through planned desk map exercises. On the criterion measure, experimental subjects outperformed control subjects. Green (40) reports that anthropology can be learned by children in Grades 1 and 4.

Three other studies indicate that children can learn more advanced material. Spodek (20) indicated gains at the kindergarten level on a unit dealing with harbor; Arnoff (1) described gains in government in three grades; and Legere (10) concludes that children can use time concepts earlier than had been previously indicated. Arnsdorf (3) indicates the effectiveness of map overlay projecturals but does not substantiate his conclusion that he used an inquiry-discovery method to accelerate learning.

Chace (5) describes a systematic first grade geography program, combining concrete experiences with map usage. McAllister (12) reports the Elkhart Indiania Experiment in Economic Education, in which basic ideas are presented to primary children in such a way that they reflect the basic structure of economic knowledge. Witt (21) reports greater gains in knowledge resulting from emphasis on ten special social studies concepts, and Shaver and Oliver (17) likewise report that instruction involving controversial issues indicates an improved capacity to handle social controversy.

Opinion Articles

A review of the opinion articles during the last ten years indicates that educators concerned with social studies are familiar with the research hypotheses of increasing knowledge before and after instruction. Crout (25) and Senesh (36) suggest introduction of economic concepts in the kindergarten and primary grades and Casteel (24), the methodology of the political scientist. Seven articles (22, 27, 28, 34, 35, 38) advocate earlier introduction of concepts and skills. Four articles (26, 30, 31, 33) believe that the expanding horizons curriculum is inconsistent with interests and abilities of children. Three writers (23, 26, 29) believe children can learn more than they are now taught. Smith (37) proposed current events to increase pupil knowledge.

Conclusion

Research and opinion thus coincide in advocating attempts to redefine and upgrade social studies content. The major conclusion that children can learn more earlier than is traditionally presented requires answers to such questions as: How advanced can innovative curricula be at an age-grade level? How are innovative curricula in one content area related to innovative curricula in other areas? What content, what methods, and what type of classroon learning are most conducive to earlier cognitive learning? What additional training will be required to teachers? How will accelerated elementary curricula affect high school curricula?

Answers to these questions will come as a result of longitudinal program research in schools based on experimentation with specific training programs. The point of departure for future research is not investigations of previous knowledge, descriptive of previous enculturation; it is the design and evaluation of training programs introduced to achieve defined learning objectives.

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16.

THE UNIVERSITY OF GEORGIA

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19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

THE STUDY OF LANGUAGE - A MULTIDISCIPLINARY SCIENCE*

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Over the past 20-30 years the study of language has received great impetus. Linguists, psychologists, speech pathologists, educators and persons of other disciplines have been involved in analyzing the structure of language, its development, its function in other forms of human behavior; as well as developing techniques and instruments for measuring ordered and disordered language abilities.

In the past each of these disciplines have tended to move in their own direction without much awareness of the research being done in the other disciplines. More recently, a growing group of researchers known as psycholinguists have been making use of the information from these several disciplines, providing us with greater insight into the language process.

My purpose today is threefold:

First, to point out the complexities of the area generally referred to as language. Secondly, to provide some organizational structure of the language process. Thirdly, to discuss several of the major review articles that are representative of the disciplines presently engaged in research within the "language area".

Language Defined

The literature provides us with many definitions of language. One of the most meaningful is a linguistic definition provided by Warfel. "Language is a structured system of overt, learned and therefore non-instinctive, sequentially produced, voluntary, human, symbol-carrying vocal sounds by which communication is carried on between two or more persons." (15, p.29) In his book Language: A Science of Human Behavior Warfel goes on to discuss the meaning of each of the ten terms used in his definition. Some people would take exception to the delimiting nature of his definition; i.e., he defines language in terms of "overt vocal sounds". To many this implies only speech, one of the aspects of language. Warfel, however, is concerned with language as a system. He does imply the relationship of language (overt human vocal signals) to the other aspects of language by including in his definition that language is used in the process of communication. This process of communication is what we must ultimately be concerned with regardless of our specialization. Human communication is the process by which these vocal symbols are transmitted from a sender to a receiver. Gray and Wise(9) would extend this definition of the communication process. They state that the communication process is not complete until the sender is also aware of the receiver's response. The use of language for communication then forces us to consider language in a broader sense. It is in this broader sense of communication that we consider language as having various modalities of reception, comprehension, formulation, and expression. Reading, writing, listening, and speaking are the primary modalities by which a language system is used for interpersonal communication.

In still broader perspective, a total understanding of language and/or communication requires knowledge of the effects these processes have on our social and psychological development. Language is important in adjustment, thought, reasoning, imagination, memory, learning as well as in the development of many other skills.

Linguistics is a science which includes within its scope all phases of language study. The term linguistics is generally used with qualifications or limitations; *e.g.*, descriptive linguistics, comparative linguistics. Francis in his book The Structure of American English (8) provides a summary of the subdivisions of linguistics. The descriptive (structural) linguists have been responsible for describing the language system.

Bloomfield provides a set of postulates (assumptions or axioms) for the science of language from the linguistic view point. He feels that even though language is a complex subject the postulational method can further its study "... because it forces us to state explicitly whatever we assume, to define our terms, and to decide what things may exist independently and what things are interdependent." (3,p.26)

According to descriptive linguistics a language system can be described internally into two primary levels: 1) the sound or phonological system (phonetics - phonemics) and 2) the grammatical system (morphemics and syntax). A complete description of a language must also take into account the operational rules (the language code) by which the two levels of the language systems are combined into messages.

Berko and Brown (2) provide a succinct description of these levels. On the phonological level the phonemes of a language and the acceptable combinations of these phonemes are enumerated.

On the grammatical level two subdivisions are generally considered. The morphological level describes the morphemes of a language and the rules for their combination. On the syntactical level the rules for constructing utterances from words are enumerated. Basically then, the conventional language code includes certain elements:

1. A set of phonemes and a set of rules governing sequences of phonemes that occur in the code.
2. A set of morphemes, defined as the shortest linguistic elements with meaning and a set of rules governing the use of morphemes in the code.
3. A set of phrases and a set of rules governing classes and sequences of words that occur in designated relationships in the code.
4. A set of sentences and a set of rules governing the structure of permissible sentences in the code.

Warfel (15) provides us with more detail by specifying eight distinct qualities which "mark a speech code".

Modern linguists then have provided us with a model of the adult language system.

Language development as a branch of the science of language had not been studied by the linguists until recently. Prior to this the child psychologists gathered a large body of information regarding normative development of language in children.

As Carroll (5) notes, one primary interest in studying language development stems from the need for information about normal growth and development of language which can reveal whether children are developing in a normal fashion, and which can provide educators with information to aid them in developing special education programs for handicapped children.

These varying interests have led to a vast accumulation of knowledge on the subject of language development.

From the early biographical studies to the later quantitative studies on large groups of children the developmental stages of language have been explored. The sequences of development have been outlined and the relationships of language to other factors have been demonstrated.

McCarthy (12) accumulated this information into valuable summaries accompanied by excellent commentaries and criticisms of the information. Recent additions to this area include Carroll's contribution (5) in the Encyclopedia of Educational Research, and the book, The Psychology of Communication by Eisenson, Auer, and Irwin (6).

From these reviews it is apparent that language development is complex but sill progresses in a somewhat systematic fashion.

Other investigations have pointed out numerous physical, environmental and psychological factors which can operate -- either singly or in various combinations -- to retard or accelerate language development. These factors could be considered as the determinants of language growth and development. The literature reveals that among the determinants generally considered to have the greatest influence on the language development of normal children are: 1) intelligence, 2) socio-economic status, 3) sex, ~~4)~~ and multiple births. Other determinants worthy of mention are: 1) race, 2) nationality, 3) bilingualism, and 4) institutionalization.

Researchers dealing with language development should recognize the influence of these numerous determinants when designing and interpreting their studies, controlling for them when important to the researchers' objectives and where feasible.

This group of studies on normal language development reflect the traditional approach to language development. They are primarily analytic studies which measured quantitatively what a child is doing at a certain age in such areas as vocabulary usage and comprehension, sound production, sentence structure, and length of response. Besides McCarthy's (12) summary, Orvis Irwin (10) provides a recent review of research methodology utilizing this traditional approach.

It has only been recently that the linguistic approach to language has been employed extensively in studying child language. Roman Jakobson (1941) is generally given credit for applying structural linguistic concepts to child language. Since that time many studies have been done determining (1) phonological patterning in children's language learning (11), the processes involved in acquisition of syntax (4), the child's use of morphological rules (1), the development of word meanings (16), and the development of grammar (13).

Ervin and Miller (7) recently reviewed current trends in language development research, emphasizing the work related to modern structural linguistics. It is important to reiterate at this time in a somewhat different manner the linguists concept of language. Ervin and Miller state: "It is evident that the vocalizing infant does not have a language. Though he may respond to adult language, we cannot begin to analyze the structure of his own language until he has at least two systematically contrasted meaningful words..." (7 p. 109). At this time, which usually occurs around one year of age the child's language development can be charted from two view points:

1. The child's closed system - by describing the child's own sound system and the set of rules he uses to form sentences.
2. The child's progress in mastery of the linguistic system of the adult model.

The development of the phonological system is described in this review on the basis of Jakobson's work. Jakobson's hypothesis "... is that the development of the sound system can be described in terms of successive contrasts between features that are maximally different and which permeate the whole system." (7, p. 112). Some generalizations regarding sound development resulting from this hypothesis of successive contrasts have gained some cautious support:

1. the vowel - consonant contrast develops earliest
2. A stop - continuant contrast occurs quite early
3. When two consonants, differing in place of articulation but identical in manner of articulation exist, the contrast is labial vs dental (e.g., /p/ vs. /t/, /m/ vs. /n/).

4. Contrasts in place of articulation precede voicing contrasts

5. Consonant clusters such as /st/ and /tr/ are generally late. It seems that the development of contrasts is related to acoustic, visual and articulation factors as well as the size of the developing vocabulary, however, it is not known what induces change in this development.

The acquisition of grammar is a complicated achievement. When children first begin to use words no systematic grammar is utilized; yet the studies by linguists indicate that the fundamentals of grammar are achieved by age four.

The limited information which exists about children's grammatical systems is based primarily on studies of individual cases. One of the major contributions in the development of grammar was done by Miller and Ervin (13).

The morpheme, the smallest meaningful element in speech is the unit used for grammatical analysis. Morphemes are divided into classes which are comparable to the traditional parts of speech. Sentences are composed of certain ordered sequences of morphemic classes. A detailed treatment of morphemic and grammatical analysis can be found in Chapter 13 by Berko and Brown in the Handbook of Research Methods in Child Development, 1960, edited by P. H. Mussen (2).

I would like to mention briefly one other topic.

Psychologists have been generating much interest in the effects of language on learning; essentially nonverbal learning tasks. The studies in this area are concerned with the function of language and deal with the hypothesis that verbal responses made during learning have stimulus value (cue-producing properties) that facilitate learning. Chapter 11 in Palermo and Lipsitt, Research Readings in Child Psychology (14) present four studies pertinent to this hypothesis.

In summary, approaching language as a multidisciplinary science allows us to develop research and educational programs that take into account:

1. the nature of language as a system used in human communication
2. how this system develops not only from the traditional concept of normative development (i.e., ages and stages) but including how the child's language system progresses toward mastery of the adult model.
3. those factors which are responsible for accelerating or retarding development (determinants of language development).
4. how the growth in language development (verbal abilities) affects other aspects of human behavior.

An understanding of these aspects of language could force us into revising our concepts about early educational procedures. Imagine for example, an educational approach that differentiated children in their first year of school (however early that might by) on the basis of language growth; followed by instruction devoted only to increasing language abilities rather than the teaching of the time honored concepts of reading and writing, etc. Consider the effects an approach of this type might have on the future learning of children.

1. Berko, Jean. The child's learning of English morphology. Word, 1958, 14, 150-177.

2. Berko, Jean and Brown, R. Psycholinguistic research methods. In P. H. Mussen (ed.) Handbook of research methods in child development. New York: John Wiley, 1960, 517-557.

3. Bloomfield, L. A set of postulates for the science of language. In S. Saporta (ed.) Psycholinguistics: A book of readings. New York: Holt, Rinehart and Winston, 1961.

4. Brown, R. and Bellugi, Ursula. Three processes in the child's acquisition of syntax. In E. Lenneberg (ed.) New directions in the study of language. Cambridge, Mass.: Inst. Technol. Press, 1964, 131-161.

5. Carroll, J. B. Language development. In C. Harris (ed.) Encyclopedia of educational research. New York: The MacMillan Co., 1960, 744-752.

6. Eisenson, J., Auer, J. J. and Irwin, J. V. The psychology of communication. New York: Appleton-Century-Crofts, 1963.

7. Ervin, Susan and Miller, W. Language development. In National society for the study of education. Yearbook 1963, Child Psychology.

8. Francis, W. N. The structure of American English. New York: The Ronald Press, 1958.

9. Gray, G. and Wise, C. The bases of speech. New York: Harper and Bros., (3rd ed.), 1959.

10. Irwin, O. C. Language and communication. In P. H. Mussen (ed.) Handbook of research methods in child development. New York: John Wiley, 1960, 487-516.

11. Leopold, W. F. Patterning in children's language learning. In S. Saporta (ed.) Psycholinguistics: A book of readings. New York: Holt, Rinehart and Winston, 1961, 350-358.

12. McCarthy, Dorothea. Language development in children. In L. Carmichael (ed.) Manual of child psychology. New York: John Wiley & Sons, Inc., 1954, 492-630.

13. Miller, W. and Ervin, Susan. The development of grammar in child language. In Ursula Bellugi and R. Brown (eds.) The acquisition of language. Monographs of the society for research in child development, 1964, 29, No. 1.

14. Palermo, D. S. and Lipsitt, L. P. (eds.) Research readings in child psychology. New York: Holt, Rinehart and Winston, 1963.

15. Warfel, H. R. Language: A science of human behavior. Cleveland: Howard Allen, Inc., 1962.

16. Werner, H. and Kaplan, Edith. Development of word meaning through verbal context: An experimental study. Journal of Psychology. 1950, 29, 251-257.

APPENDIX I

ANNOTATED BIBLIOGRAPHY

Baddeley, A. D. Language habits, S-R compatability and verbal learning. Amer. J. Psychol. 1964, 77, 463-468.

It was predicted that pairs of nonsense syllables which fit together to give a letter combination occuring frequently in English (compatible pairs) would be learned more rapidly than pairs which combine to give a less probable letter sequence (incompatible pairs). In Experiment I, eight pairs of syllables were so selected that in one order they formed a compatible pair, but when reversed became relatively incompatible. Experiment II was concerned with serial learning; it used 10 eight-item lists, each of which formed a compatible sequence of syllables in one order, but a relatively incompatible sequence when reversed. In both experiments, the compatible material was learned significantly more rapidly than the incompatible. Meaningful associations did not appear to be an important factor in either study. It is suggested that nonsense-syllable learning may be regarded as the acquisition of a motor skill in which the subject transfers from his established language habits to a new sequence of verbal responses. A compatible sequence, being similar to the language in sequential structure, allows more positive transfer and is thus learned more readily.

Berko, J. The child's learning of English morphology. Word, 1958, 14, 150-177.

Preschool children and first grade children were tested to discover what is learned by children exposed to English morphology. Nonsense words with descriptive picture cards were used, and the children were asked to supply English plurals, verb tenses, possessives, derivations, and compounds. It was demonstrated that children in this age range operate with clearly delimited morphological rules and did their best on the items where general English phonology determined which allomorph was required. Boys and girls did equally well, but there were some differences between preschoolers and first graders.

Berko, Jean, and Brown, R. Psycholinguistic research methods. In P. H. Mussen (Ed.) Handbook of Research Methods in Child Development. New York: John Wiley, 1960, pp. 517-557.

This chapter reviews language as a system and reports linguistic and psycholinguistic. research in this area. After an introduction of the area the authors divide the research into sections dealing with the phonological system, the reference system, the morphological system and the syntactic system. They discuss how past research has been done and show how linguistic research on adults can be adapted for study of the child's developing language system.

Brown, R. W. Linguistic determinism and the parts of speech. Journal of Abnormal and Social Psychology. 1957, 55, 1-5.

Eight children between the ages of three and four years and eight children between the ages of four and five years were subjects in this study to show how the allocation of words to one or another part of speech affects cognition. Three sets (involving action, a mass substance, and a certain object) of four pictures each were used. Ten of the 16 children selected the action pictures for the verbs, eleven children picked the object pictures for the noun; and twelve children chose the mass substance when the word was a mass noun. Usually the children use nouns as names of things and verbs as names of actions more than do adults. The children take the part-of-speech membership of a new word as a clue to the meaning.

Brown, R. and Fraser, Colin. The acquisition of syntax. In Cofer, C. (ed.) Verbal Learning and Verbal Behavior. New York: McGraw-Hill, 1961, pp. 158-197.

"For the present, then; we are working with the hypothesis that child speech is a systematic reduction of adult speech largely accomplished by omitting function words that carry little information. From this corpus of reduced sentences we suggest that the child induces general rules which govern the construction of new utterances. As a child becomes capable (through maturation and the consolidation of frequently occurring sequences) of registering more of the detail of adult speech, his original rules will have to be revised and supplemented. As the generative grammar grows more complicated and more like the adult grammar, the child's speech will become capable of expressing a greater variety of meanings." (Author conclusions)

Carroll, J. B. Words, meanings and concepts. Harvard Educ. Rev. 1964, 34 (2), 178-202.

A framework for conceptualizing the relations between words, meanings, and concepts is presented. A concept is an abstracted, cognitively structured class of experiences learned by a particular individual in the course of his life history. Many words or other units of a linguistic system come to stand for, or name, concepts that have been learned preverbally; to the extent that these relationships are similar for the members of a speech community, words have "meanings." The paper concerns the problem of teaching concepts in school, both inductively (by presentation of positive and negative instances) and deductively (by verbal explanation and definition).

Darley, F. L. and Winitz, H. Age of first word: Review of Research. Journal of Speech and Hearing Disorders. 1961, 26, 272-290.

The age of appearance of first word as reported for 26 groups of children is reviewed. From the results of these studies it appears that the average child begins to say his first word by approximately one year. Delay of appearance of first word beyond 18 months may indicate a serious physical, mental or hearing involvement. There is as yet no evidence to indicate that age of first word has any utility for predicting severity of articulation defectiveness at some later date. The clinical utility of this language measure will depend upon future longitudinal investigations. It is also suggested that experiments utilizing learning principles may prove useful in analyzing the interpersonal events between mother and child which lead to the infant's early words.

D'Asaro, M. J. and John, V.A. A rating scale for evaluation of receptive, expressive, and phonetic language development in the young child. Cerebral palsy rev., 22, 1961, 3-4.

A report of an experimental revision of the R-E-P Language Scale. The preliminary findings of the standarization study of this scale revealed the expected pattern of adequate grading of difficulty in items. In addition, the scale was used in a diagnostic setting with 34 speech handicapped children. The results of the scale correlated significantly with the scores of the Vineland Scale of Social Maturity. Within this diagnostic population, two subgroups with different language patterns were identified. The severely mentally retarded child showed equally depressed receptive and expressive scores. The standardization study is being continued.

Evertts, Eldonna L. An investigation of the structure of children's oral language compared with silent reading, oral reading, and listening comprehension. Doctor's thesis. Bloomington: Indiana University, 1961.

An investigation of the oral language of sixth-grade pupils and the relationship of the structure of the language to their silent reading comprehension, oral reading interpretation, and listening comprehension found that maturity of language was frequently expressed by: greater sentence length, fewer short utterances, greater use of the common structural patterns, increased use of movables and elements of subordination, and variation within the slots and movables. Maturity of language seems to be a composite of many linguistic skills which influence in varying degrees the use and structure of oral language at the sixth grade level. There was also a closer association between oral language and reading than has hitherto been recognized.

Fowler, W. Cognitive learning in infancy and early childhood. Psychol. Bull. 1962, 59, 116-152.

A critical examination of representative studies on cognitive learning in early childhood is presented to gain perspective on research problems which have neglected to visualize the scope and complexity of learning in this period. Areas covered include simple abilities, motor development, verbal memory, language, conceptual processes and intelligence, special cognitive processes, and early cognitive stimulation and psychosocial development. Traditionally, two major viewpoints explaining processes of development and accounting for the acquisition of knowledge in preschool years have been predominant. Concepts derived from biology postulate intelligence and various abilities as inherited and give little credit to environmental stimulation. A behavioristic outlook, in its concern for dealing with operationally definable processes, has generated a situational focus. The author feels that there is a great need for more complete knowledge about the learning processes and abilities of the young child.

Fraser, Colin; Bellugi, Ursula; and Brown, Roger. Control of grammar in imitation, comprehension, and production. Journal of Verbal Learning and Verbal Behavior. 1963, 2, 121-135.

The familiar assertion that, in language development, understanding precedes production was tested for 10 grammatical contrasts with 12 preschool children. Production, as the correct production of contrasting features in sentences applied appropriately to pictures, was less advanced than understanding. Production, in the sense of imitation without understanding, was more advanced than understanding.

Hanley, T. D. and Thurman, W. L. Developing Vocal Skills. New York: Holt, Rinehart and Winston, 1962.

It is the author's observation that the degree of student improvement depends upon the nature of student experiences in two aspects of a speech course: (a) exercises in the manipulation of the vocal mechanism for enhanced control, flexibility, and effectiveness, and (b) learning experiences involving physiological and acoustical fundamentals of voice communication. Experiences of both kinds, designed for use in courses in speech improvement, voice and diction, voice development, or similar courses which combine knowledge of the principles of voice production with practice in effective vocal usage are presented in the text. Data from the sciences of acoustics and anatomy applied to phenomena of vocal communication are concentrated essentially in the first half of the book. The tools of the phonetician are presented. Frequently research references are included. In the applied section of the book the information in the early chapters is drawn upon to expand the student's understanding of each aspect of vocal production as he seeks to improve it. For practice in breathing for speech and control of pitch, rate, articulation and quality, exercises are included which the authors believe to be representative of everyday communication needs of young adults. Practice materials include many examples of usual conversational speech. Discriminating listeningof others is emphasized as a root to critical self-listening. Each applied chapter is designed to heighten the student's awareness of one aspect of his vocal operation and to help him develop conscious control of it. An accompanying project book entitled Student Projects for Developing Vocal Skills provides the instructor with forms to assist him in evaluating student performances. Summary projects are suggested to related practice on each isolated factor in vocal output to daily vocal needs.

House, A. S., Stevens, K. A. Sandel, T. T. and Arnold, J. B. on the learning of speechlike vocabularies. J. Verb. Learn. and Verb. Behav. 1962, 1, 133-143.

This article describes a series of experiments dealing with the learning of ensembles of speechlike acoustic stimuli. The stimulus ensembles differed with respect to the number of physical dimensions that were manipulated in generating the stimuli, and with respect to the extent to which the stimuli resembled speech. Results show that performance during learning is better when each stimulus is encoded into several physical dimensions than when the stimuli lie further alongan undimensional continuum. As the stimuli become more like speech, there is a deterioration of performance during learning with the exception that performance is best when the stimuli are actually speech signals. Implications for theories of speech perception are discussed.

Irwin, Orvis. Language and communication. In P. H. Mussen (ed.) Handbook of research methods in child development. New York: John Wiley, 1960, pps. 487-516.

This chapter deals with research methods that have commonly been used for studying children's language development. The author discusses the research method and provides information regarding specific studies that have utilized the method discussed. He covers the following areas of language development: infant vocalization, vocabulary measurement, the mastery of sentence structure, thought unit analysis, speech errors, functions of language, and diagnosis and assessment of defective speech.

Irwin, R. B. The effect of speech therapy upon certain linguistic skills of first-grade children. J. speech hear. dis., 28, 1963, 375-381.

A study of the effects speech therapy, as practiced by public school clinicians on a twice-a-week basis for seven months has on articulatory efficiency, reading, readiness, word recognition, word meaning, sound discrimination, and sound stimulability. No significant changes occurred as the result of the speech therapy in any of the linguistic skills measured, although trends were indicated in favor of those receiving speech therapy.

Lenneberg, E. H. Understanding language without ability to speak. J. Abnorm. Soc. Psychol. 1962, 65, 419-425.

A case of an eight-year-old boy with a congenital disability for the acquisition of motor speech is presented. The report includes brief medical and family histories, results of psychological testing, and a detailed analysis of voice and speech. Despite the motor deficit, evidence was presented that the boy had acquired grammatical skills and was able to understand language. The author discusses these findings in terms of his contention that the vocal production of language is dependent upon the understanding of language, but not vice versa. Present theories assert that babbling, hearing oneself vocalize, and imitation are the cornerstones of speech development. The case presented, together with the language deficit in certain mongoloids, clearly shows that babbling, hearing oneself talk, and imitation are neither sufficient nor necessary factors in the acquisition of grammar. Since the motor skills alone are never shaped into "speaking without grammar" - parroting without understanding - it is concluded that the present theories are inadequate.

Liamina, G. M. Development of speech understanding in children of the second year of life. Vop. Psikhol., 3, 1960, 106-121.

As has been found in children between one and two years of age, a connection between an object and the word by which it is denoted is established rather quickly. However, as soon as orientation conditions grow more complicated and differentiation of the object named becomes more difficult, this connection is marked by unstableness and weakness. This has been observed in 20 to 22 month old children while selecting objects (whose names had been learned) from among a multitude of other objects by differentiating between the objects with similarly sounding names and by recognizing their images. In the second year of life the ability of generalization starts to develop. However, recognition of objects by color, size, or shape from similar objects, or from their models or pictorial representations, is characterized by unstableness. The investigation results have confirmed the necessity of introducing a gradation among the objects shown with respect to their connections and interrelations. This facilitates the formation of the object-word connections and is quite indispensable for the development of generalization ability.

Lovell, K. A follow-up study of Inhelder and Piaget's "The Growth of Logical Thinking." *Brit. J. Psychol.*, 52, 1961, 143-153.

Subjects were questioned and encouraged to "think aloud" as they worked problems, and verbatim records were kept of this procedure. Results confirm the general stages in the development of thought proposed by Inhelder and Piaget, with only the ablest of older students achieving the stage of formal thought. Subjects showed agreement in their performances on four different tests, indicating some stability of thinking skill. Records of answers and thinking aloud indicate the processes of reasoning followed steps like those reported by Inhelder and Piaget. Instruction does not seem to affect results much unless the student has learned the thinking skill involved. The authors feel that the atmosphere of the classroom is especally important in developing such thinking skills, and that more needs to be done in schools to pose problems to children and encourage them in working out solutions.

Malitskaia, M. K. On the use of pictures to develop speech understanding in children at the end of the first and during the second year of life. *Vop. Psikhol.*, 3, 1960, 122-126.

The present investigation was carried out on 10 healthy children aged 10 to 15 months with a view to find out the possibility of the formation at this age of word-image connections. It was found that even at the age of 12 to 13 months such connections can be formed under some conditions after a single reinforcement. The most important condition for developing these corrections is the presence of an intense orienting reaction to the named image, as is the case when a new image is placed among other images whose names the child already knows.

Menyuk, P. Syntactic structures in the language of children. *Child Development*. 1963, 34, 407-422.

The purpose of this study was to use an explanatory model of grammar, Chomsky's model of syntactic structures, to determine if it was capable of describing a children's grammar as a self-contained system and of indicating developmental trends. Language was elicited and tape recorded in three stimulus situations; a. spontaneous speech in response to The Blacky Pictures, b. conversation with an adult (the experimenter), and c. conversation with peers. For cross-validation purposes, the language used in the classrooms of the sample population was transcribed. The langauge sample of each child and of the class room groups was analyzed using Chomsky's technique. It was found that the basic structures which generated all the sentences obtained could be described within the framework of the Chomsky model. A children's grammar was written which included all the rules used at both age levels to generate structures consistent with adult usage and those which, presumably, are not. All the basic structures used by adults to generate their sentences were found in the grammar of the nursery school group.

Metraux, R. W. Speech profiles of the pre-school child 18-54 months. Journal of Speech and Hearing Disorders. 1950, 15, 37-53.

The purpose of the study was to synthesize some of the things known about the speech of the child at various ages. Two hundred and seven children were analyzed at the ages 18, 24, 30, 36, 42, 48, and 54 months. For each child a Gesell developmental examination was recorded and a phonetic transcript was made of all speech during the examination. At each age level these areas were considered: pronunciation, voice, repetitions, relation of language and activity, language relation to others, tensional outlets in language situations, and illustrative excerpts.

Milgram, N. A. and Furth, H. G. The influence of language on concept attainment in educable retarded children. Amer. J. Ment. Defic. 1963, 67, 733-739.

The study, replicating Furth's work with deaf children, compared educable retarded children and normal mental age controls on a series of concept tasks assumed to vary in the degree to which language experience might facilitate attainment or discovery of the concept. Results confirmed predictions: The retarded performed more poorly in the discovery and application of a language-relevant concept that was within their realm of comprehension, but performed as well as normals in solving problems where perceptual rather than verbal modes of solution were assumed to be more suitable.

Miller, W. R. The acquisition of formal features of language. Amer. J. Orthopsychiat., 34, 1964, 862-867.

The code or linquistic system which a child must learn has two components, the sound system and the language system. The first is contained in the vocabulary the child gradually acquires. The acquisition of this system may be viewed as a process of substitutions, as a self-contained system of contrasts, or as a passive auditory process. The language system, in sharp contrast, demands the understanding of grammatical rules which then can be used to produce sentences that have never been used or possibly even heard before by the speaker. Variations in linguistic patterns observed among children in the same culture may reflect innate individual differences. However, "a hypothesis based on environmental differences might be more fruitful, if only becuase it would be easier to test."

Russell, D. H. and Saaden, I. Q. Qualitative levels in children's vocabularies. J. educ. psychol., 53, 1962, 170-174.

An experimental list (taken from 1st Thorndyke Thousand) of 40 items given to 257 third, sixth, and ninth grade pupils revealed a definite decrease in choice of concrete definitions and increases in functional and abstract choices at each higher level, and especially between the third and sixth grades. Significant differences were obtained between all categories except functional choices in the sixth and ninth grades. When children were classified according to their dominant response on the vocabulary test (at least 40% of the choices in that area) it was found that there was a significant differences between the mixed and both the functional and abstract groups at the 1% level of confidence.

Slama - Cazacu, T. A study of dialogue among preschool children. Vop. Psikhol., 2, 1961, 97-106.

The purpose of this investigation was to study the various forms of children's dialogue.Subjects consisted of 61 preschool children between the ages of two to three who were enrolled in a day nursery in Bucharest. Groups of three to five children were brought into a laboratory setting which was equipped with various play equipment. While the children were absorbed in their play, their conversations were tape recorded. The findings were treated under three headings (a) Forms of addresses, (b) Dialogue between two children (c) Dialogue among several children. The results indicated the existence of dialogue at this age, and its contents and form being naturally adequate to the interests and the possibilities of expression found with respective age.

Smith, J. O. Group language development for educable mental retardates. Except. Children, 1962, 29, 95-101.

Findings of the reported experimental study indicate that language ages of young, educable, mental retardates could be significantly increased over a three-month treatment period. The group language program involves each child as an active participant in all stages of each lesson. Samples of specific activities are outlined by their expected area of enrichment.

Templin, M. C. Development of Speech. J. Pediat. 1963, 62, 11-14.

Normative data related to the development of speech sounds, speech, vocabulary, grammar, and length of utterance is given. Studies concerning factors which influence language development are presented. While there have been attempts to develop general language scales, the multiplicity of factors involved necessitates further investigation. It is suggested that within the next few years substantial progress will be made in this area.

Velten, H. V. The growth of phonemic and lexical patterns in infant language. Language. 1943, 19, 281-292.

The author kept a record of his daughter's speech from her 11th to 36th month. After the first stage of babbling, the ability to produce many speech sounds seemed to vanish. The use of distinctive sounds is restricted because a child acquires a phoneme system by proceeding from the greatest possible phonemic distinction to smaller differentiations. The first six phonemes appear in this order: a vowel and consonant produced by closure of oral and nasal cavities, and addition of a continuant, a second sound stop, a second continuant, and a second vowel. The acquisition of initial vocabulary is divided into: (1) words accompany action, (2) ba-bada stage accompanying coordination of hand and eye, (3) dietic stage of incessant linguistic effort, and (4) the stage of classification. The development of a child's language may serve as a miniature working model of diachronic linguistics.

Weir, R. H. Language in the crib. The Hague; The Netherlands: Mouton, 1962.

The subject matter consists of an analysis of monologues of a two-and-a half year old child, lying in his crib, talking to himself. The linguistic structure is described on several levels with regard to the structures which have been learned well, those which are being learned, and those which are still absent in comparison with standard English. On the level of sound, the phonemes are broken down into their component features in order to arrive at a clearer picture of the child's linguistic development. The analysis of sentences as the highest structural unit within the monologues did not provide a complete enough picture of the nature of the material, and hence a paragraph analysis is included. The various functions of language are discussed in their hierarchical arrangements. The more than 2,500 tape-recorded verbal phrases are transcribed phonetically in the appendix.

Zigler, E., Jones, L. V. and Kafes, P. Acquisition of language habits in first, second, and third grade boys. Child Development. 1964, 35, 725-736.

The Language Modalities Test for Aphasia was administered to 44 first-, second-, and third-grade boys, subdivided according to three levels of test anxiety. A multivariate analysis revealed significant grade effects, with neither anxiety effects nor anxiety-by- grade interaction effects approaching significance. The ability of each of the subtests to discriminate between grade levels was assessed and discussed. The findings suggested that the language process can be meaningfully segmented into components which display differential patterns of development.

17.

THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

WRITTEN COMPOSITION*

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INTRODUCTION

In a complex and dynamic society a basic human problem is expression of understanding. It is doubtful that full understanding exists if it cannot be communicated to others clearly through speaking and writing. As a major form of communication writing offers time to digest, properly interpret, and reassess what is to be communicated.

Writing is difficult to teach because it is not merely a matter of acquiring certain skills and techniques, but it involves also the reflection upon attitudes and motives, implicit and often unconscious values, and perceptions. Instruction in writing, as distinct from the rudiments of the written language (penmanship, spelling, grammar, and punctuation) must take into account the personality and environment of the pupil. Writing depends not only on cues supplied by personal and social experience, but also to some degree on the reconstruction of that experience as it has been affected by the pupil's own history of reading. Facility in writing for the young is sometimes hampered by limited amounts and kinds of reading.

Negative attitudes toward writing and lack of skill in composing begin to develop very early in the young child. The home often fails to stimulate and use the young child's interest in the world about him so that he will employ language symbols for the expression of ideas and feelings. Likewise, the school frequently fails to realize the full opportunity for continuous instruction in written composition by ignoring it altogether, teaching it as a subject of form and order, or limiting expression to a casual recounting by the child of everyday happenings and events. It is commonplace to note that the school emphasizes penmanship, spelling, correct usage, felicity of expression, and effective communication of stimulating ideas or information in that order, when a reverse arrangement is more in keeping with the development of mature written composition.

The process of composing is an ordering, arranging, or settling of meaning contained in verbal symbols into a due position or relation. It involves formation of ideas to be expressed, establishment of purpose and motive for their expression, and use of skills to express them effectively.

The formation of ideas is an intricate process which depends upon the individual's ability to discover meaning from experience, to acquire vocabulary, and to use the structure of the language which makes the expression and reconstruction of meaning possible. Simple forms of the elements of composition, such as description, analysis, and argumentation, require breadth of experience with people, things, places, and books, and ability to observe and select distinctive aspects of that experience.

The power of composing depends on the richness and arrangement of verbal categories to convey meaning to selected persons. These categories are not built into the human organism but rather are acquired from the culture in which the individual lives. Written language is an itemized inventory of reality that reflects the particular kind of psychosocial standardization of word-object and word-idea relationship as well as the characteristic attitudes, values, and ways of thinking that prevail in a given culture or subculture. Characteristic patterns of thought in a particular culture affect the nature of the written language that evolves, and it, in turn, patterns and limits the type of thinking in which the individual members of the culture engage.

For facts to be understood, appreciated, and remembered they must be fitted into an internal meaningful context. To get to the core of meaningfulness the child must come upon regularities and relationships in his environment. Once aroused by the expectancy that there is something to find he must devise ways of finding it. Rearranging evidence in the form of words, percepts, concepts, and generalizations, he will discover new insights and paths to the center of all knowledge. The interplay between thought and symbol, when subjected to the exercise of writing and revision, will lead to increased clarity of thought and expression. Skill in written composition, the self-discipline that is developed through constantly choosing the best vehicle for meaning, will become a way of discovering for himself paths to knowledge.

Research

Research works in composition have been largely either surveys of existing practices and opinions or occasional experimental studies, rather than penetrating theoretical formulations, in terms of which a group of interrelated studies could be conducted. From the quantity of investigations reported it appears that skill activities leading to the products of written language tend to stimulate research that will furnish immediate answers to specific problems of teaching practice in particular learning situations.

Major studies have been arranged to deal with relationships between the child's use of oral and written language, language learning, and structure of the language.

Child's use of oral and written language. One important aspect of language development is the amount of talking done by the child in home and school. Between three and five years of age the normal child in a relaxed and permissive atmosphere is very productive orally. From the all-day record of his conversation one child at the age of forty months was using 11,623 words in one day at an average of 950 words per hour (Brandenburg, 1919). At fifty-two months the same child was using almost 15,000 words in one day. These figures indicate that the three-and-four-year-old in a favored environment where talking is stimulated and encouraged gets a great amount of practice in the use of oral language. Such practice is missed by the child who is delayed six months or a year in the onset of language or the child who is discouraged from talking by an unfavorable or restricted environment.

Picture vocabulary tests (Van Alstyne, 1919; Ammons and Ammons, 1948) can be used for the purpose of securing quick estimates of the verbal ability of children from two to five years. These measures can be used also to test the intelligence of the physically handicapped and retarded child.

The child's vocabulary of use and his vocabulary of recognition and understanding should be determined and studied separately (Templin, 1957). Vocabulary of use includes words actually produced in oral and written speech; vocabulary of understanding consists of words recognized or understood when heard or read. These vocabularies of children from upper and lower socio-economic status differ.

McCarthy (1930) introduced a method for studying the language development in the preschool child that has been used extensively by subsequent workers (Day, 1932; Davis, 1937; Little and Williams, 1937; Shire, 1945; Templin, 1957). She secured fifty verbalizations by 140 children ranging in age from eighteen to fifty-four months. Verbalizations were elecited by toys and books. Responses were analyzed in terms of length, grammatical form, and parts of speech.

In trying to find topics suitable for children's compositions an analysis of their talk during discussion periods is suggestive. One investigator (Baker, 1942) studied children's contributions to discussion periods in grades two, four, and six. The second-graders devoted almost all of their discussion time to their own activities, or to their homes. The sixth-graders told of material which had come to them vicariously, most often through reading. The fourth graders were midway between in the use of immediate and vicarious experience.

A comparison (Harrell, 1957) of the development of oral and written language in school-age children involved 320 subjects aged 9, 11, 13, and 15. The average length of stories written in response to a movie shown in class increased with age, with girls writing longer stories at each age than the boys. At all ages the oral stories were longer than the written ones. The subjects used more subordinate clauses in writing than in speaking and this difference increased with age. They used also more adverb and adjective clauses in their writing, but a greater percentage of noun clauses in their speaking. They used a greater percentage of all types of adverbial clauses in speaking than in writing, with the exception of clauses of time and cause. In none of these indices of oral and written language were these children approaching a mature level.

Children's use of time concepts is contrary to many of the usual curricular techniques of teaching verb tenses (Bender, 1947; Goldfarb, 1955; Brock, 1962). Those children who feel secure and trustful of adults are superior in use of time concepts to children reared in institutions or foster homes. The ability children show in writing their ideas on paper has an interrelation with the ordering of perceptions and experience into concepts of time (Gough, 1965).

Language learning. The child from birth builds up schemata of segments of relaity. As the child develops gradually his own constructions of reality on the basis of sense data with which he is presented, there is an interaction and accomodation between thought processes and language categories (Piaget, 1954; Church, 1961). The child perceives only personally meaningful objects, and what he perceives is not so much the object as its meaning (Church, 1961). Time and well-planned direction are needed to assist him in integrating his bits of knowledge into an orderly system (Bruner, 1956).

Children at first use language as a form of play and as an attempt to satisfy other needs (Lewis, 1951), feelings, and desires (Shirley, 1938). Too much attention has been given to grammatical analysis and too little to the developmental changes in conceptual thinking and social drives that lie back of verbal expression (Goodenough, 1938; Sutton, 1960).

Children very early form large abstract categories. Abstraction pushed too fast often results in the recognition of words rather than in concept formation (McCarthy, 1954). Children need ample experience as the basis for concept attainment and explicit guidance in concept formation. They need to be encouraged to form unusual classifications, imaginative groupings, and new combinations (Serra, 1953; Sutton, 1961).

Teachers, to the great loss of originality, tend to stereotype their own concepts and to think of a thing in only one approved way (Davis, 1961). Impoverished backgrounds often contribute to a lack of motivation in the use of language and also to subsequent intellectual retardation (Goldfarb, 1945; Findley, 1960). Language usage is most affected by home and neighborhood and least affected by schooling (Findley, 1961).

Composition is a means of clarifying, organizing, and applying ideas gained from reading and discussion. Pupils may project information about themselves useful in guidance of learning (Meckel, Squire, and Leonard, 1958). Children can be helped to use a wide variety of content and expressive phrasing when not restricted to content and form (Betzner, 1930).

Interdisciplinary studies of philosophy, psychology, linguistics, sociology, anthropology, and methodology (ECSC, 1964) reveal that eminent scholars who are able to make siginificant contributions to the substantive reorganization of English have not participated previously in curriculum construction. Consequently, the teaching of composition in the elementary school has often dealt inadequately and incorrectly with pertinent contemporary knowledge. The study further reveals that programs in written composition give little attention to planned sequences in leanring; for example, the identification of major concepts, values, and skills to be taught; placement in the program where these are first introduced and dealt with subsequently; and reconstruction of major concepts, values, and skills through continuous expereicnes. Also, the conditions under which children usually write have not contributed to attitudes about writing that encourage optimum effort and learning.

Structure of the language. Length of response in terms of number of words is considered the most easily determined and objective method of studying the sentence. Sentence completeness is a persistent problem. It is related to the complexity of sentence patterns and thought processes (Frogner, 1933; LaBrant, 1933). LaBrant (1933) used the mean length of the clause and suggested that counting predicates is an objective method for studying the sentence. Templin (1957) classified responses of sixty children from three to eight into six major categories; functionally complete but structurally incomplete; simple without phrase; simple with phrase; compound and complex; elaborated; incomplete.

Templin (1957) has intercorrelated measures of articulation, length of response, complexity of response, sound discrimination, vocabulary, and number of different words. A feature of this study, one of the most comprehensive treatments found in the literature, is an attempt to use a terminal status measure as a base for estimating the interrelations of the various language skills.

Brown and Berko (1960) administered a usage test composed of nonsense syllables and a word association test to subjects in first, second, and third grades, MIT students, and staff members. Scores on both tests increased regularly with age and were related to each other. Change in word association and ability to make correct grammatical use of words result from the child's developing appreciation of English syntax.

Growth in the power to form complete, concise, balanced, consistent sentences is an index of the growth in clear, accurate thinking (Symonds and Daringer, 1932). Knowledge of the structure of a language is essential for precision in writing and necessary for identifying various forms considered acceptable in usage. Judiciously employed grammar supports usage instruction (Pooley, 1957). Children use nouns as names of things and verbs as names of action more reliably than adults (Brown, 1957). In order for the child to make discriminations adequately he has to comprehend that a word has a relatively stable and self-contained meaning and that it is placed in a sentence which itself has a stable structure (Werner and Kaplan, 1960).

The educational and English journals are replete with articles about investigations on the incidence of various types of grammatical errors in the oral and written language of school children. Most of these studies are poorly controlled and stress the fact that errors continue in the speech and writings of children throughout the school period in spite of the educational influences aimed to overcome them. One of the better studies on written language is by Symonds and Darringer (1930) in which the authors report that in the fourth grade there are on the average about two errors to every sentence, and that this ratio shows a gradual decrease until the eighth or ninth grade, when there is about one error per sentence in children's writings. In a detailed analysis (Carlton and Carlton, 1945) of the frequency of different types of errors in children's written work four kinds of errors accounted for half the total number of errors made.

There is limited and inconsistent research on the effect of extensive reading on children's writing (Wyatt, 1962). Although there were isolated significant correlations between wide reading and writing achievement of three groups of selected sixth graders, no consistent significant relationships were found among all groups.

Linguistic analysis has had a decided influence on recent normative and developmental studies of child language behavior. Strickland (1962) used mainly the linguistic categories established by Frances in her cross-sectional studies of the development of syntax in the speech of children in grades one to six. She observed that writers of textbooks carefully control the school book vocabulary but seem to have no scheme of introducing the patterns of sentence structure and no methods of teaching and reinforcing these patterns. Loban (1963) was able to make some use of generative grammar (Chomsky, 1959) in his longitudinal study of the speech and language development of 338 children from kindergarten through elementary school. These linguistic approaches enabled the investigators to dispense in part with the older, less exact measures of language development such as sentence length and to present a more accurate picture of the ways in which children differ in their language development.

SUMMARY

Many studies mentioned in this review of the research on written composition of the young child have applied interesting approaches to important problems but they have limited value in providing definitive answers. Rigorously defined and controlled research is needed to go far beyond the results of earlier investigations.

Great strides have been made in theoretical formulations for some aspects of language, but there is a pressing need for the development of a comprehensive theory of language behavior that will not only unify the numerous research contributions in the psychology of language, listening, speech, and mass communication but also give directions to applications of basic principles to classroom experiences in verbal learning.

Studies in verbal learning have not been related to the form and structure of language. A comprehensive theory concerning speech and language behavior is needed so that unified and systematic experimental efforts may be directed toward understanding the complexities of language behavior. The productive side of meaningful verbal learning in classroom writing and speaking experiences would appear to depend more on an understanding of the molar properties of grammar in language than upon the findings derived from repetitive experimental tasks with nonsense syllables and with hypothetical procedures.

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18

THE UNIVERSITY OF GEORGIA

Athens, Georgia

19TH TEACHER EDUCATION CONFERENCE

Theme: IMPLICATIONS OF EARLY EDUCATIONAL STIMULATION FOR TEACHER EDUCATION

Child Development*

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Overview:

The search in the literature in which the writer has been engaged has revealed few evaluation devices which attempt to measure relationships between or among psychomotor, cognitive, and affective aspects of child development. An attempt will be made to draw together studies and low-level theory which offer ideas regarding the interrelatedness of the areas. Possible implications for teacher education of these interrelationships will be noted.

Baldwin, A. L. A is happy--B is not. *Child Develpm.*, 1965, 36, 583-600.

Baldwin points out the present dichotomy in the debate on preschool education regarding orientation toward personal-social adjustment *or* cognition. He suggests that the separation of these two distinct areas is perhaps unwarranted. "First, cognition and well-adjusted human behavior are not unrelated . . . Second, I will maintain the position that there are many ways external information can become incorporated in behavior, and some of these are best described as noncognitive." Data are presented which support the hypothesis that there are "logical principles underlying the interpretation of the interpersonal relations and that these principles form a coherent set from which conclusions about interpersonal behavior can be logically derived."

Banks, J. H. and Wolfson, J. H. Autonomic measurement of the emotional development of the infant; Changes in responses by the infant in the first three months to mother and stranger. (mimeographed)

Using the electrocardiogram for the purpose of measurement, Banks establishes reliable variation in response of an interpersonal nature when the infant is presented with his mother as a stimulus and a stranger as a stimulus.

Deal, Therry N. A measure of children's reasoning about interpersonal relations. Unpublished doctoral dissertation, Univer. of North Carolina at Greensboro, 1965.

Deal pursues the relationship between a cognitive function, reasoning, and an affective area, interpersonal relations. A measure of children's reasoning was developed which indicated that children are capable of reasoning in a syllogistic fashion about interpersonal relations.

Deal, Therry. Coder agreement on content analysis of interactions of preschool children. Unpublished master's thesis. Woman's College, Univer. of North Carolina, 1963.

Three groups of raters were compared in their inter-rater agreement when rating diary record accounts of preschool behavior on the dominance-submission continuum. The three groups of raters were a trio of "experts" who had advanced training in social-psychological sciences; a group of undergraduates who were potential social-psychological area degree candidates; and a group of graduate students who were either teachers or degree-students in a child development program. The obtained agreement for each group was similar, being slightly above 75 per cent. Profiles of finer rating discriminations were also similar though agreement was much lower. This work would support Osgood's conclusion that a common "theory" was apparantly in operation when judging personality variables at this rather global level.

Duffy, Elizabeth. *Activation and Behavior*. New York: Wiley and Sons, 1962.

Duffy starts with the premise of behavior as a function of the entire organism. She points to the term emotion in use in psychology as a false attempt to delineate one aspect of behavior from others. She provides an extensive review of the literature using autonomic measures of behavior. She attests emotions as being measured as accurately by autonomic measures as by other less quantifiable techniques.

Heider, F. *The Psychology of interpersonal relations*. New York: John Wiley, 1958.

Heider presents both his own theoretical approach to psychology and research which appears relevant. He takes the position that in the area of interpersonal relations psychology has much to learn from everyday language and experience which he terms "naive" psychology. He notes that all practice "naive" psychology regardless of the validity of the assumptions. He points out that non-scientific language symbolizes the experiences of human behavior.

He tries to delineate the logic which is implicit in a variety of interpersonal relations.

Kohlberg, L. Development of moral character and moral ideology. In Hoffman, M. L. and Hoffman, L., editors, Review of Child Development Research, Vol. 1: New York: Russell Sage Foundation, 1964.

Kohlberg presents a review of research on moral development. He suggests that moral character has been explained as superego strength, good habits, or ego strength. He prefers to consider the ego interpretations as most adequate. Research is presented which supports this position. The major consistencies in moral conduct are represented by decision-making capacities. He presents the correlations from various studies which would support the relation between morality as represented by such ego variables as general intelligence, ability to anticipate future events, non-distractibility, capacity ot control unsocialized fantasies, and self-esteem. He concludes with a discussion of implications about moral development related to the tasks of the classroom teacher.

Jersild, A. T. In search of self. New York: Teachers College, Columbia Univer., 1952.

"Mr. Jersild believes that the child has more capacity for understanding himself than we educators, or others for that matter, have ever realized.

He believes, too, that something can be done, by teachers to aid boys and girls to make what is probably the most important discovery of all--a discovery of themselves." Jersild presents normative data on the concepts of self-evaluation used by students in the study. Though he does not specifically explore the cognitive-affect relationship he supports a position that "self-understanding must use all the resources the school can command--intellectual, social, and emotional. In effect, he says they are interrelated. He wishes the teacher to recognize the role he has in promoting self-understanding. "We are simply saying that the teacher should try to function to the best advantage in the psychological role which he already occupies. As a teacher he already is in a position to have a profound influence on his pupils, for better or for worse."

Piaget, Jean. The genetic approach to the psychology of thought. Journal of Educ. Psychol., 1961, 52, 275-281.

Piaget suggests that the three most common explanations for the development of thought, maturation; experience (learning); and social interaction (environment), are not sufficient. He proposes the concept of equilibrium in addition to these three. He agrees with Bruner who has critiqued the equilibrium concept that it is similar to motivation. Piaget claims as the advantage of his language the union in the "same totality those two aspects of behavior which always have a functional solidarity because there exists no structure (cognition) without an energizer (motivation) and vice-versa."

Osgood, C. E. Studies on the generality of affective meaning systems. American Psychol., 17, 10-28.

This author makes the generalization, based on his previous work, that evidence to date indicates considerable generality in semantic space across people. In exploring explanations for this he notes that three factors which tend to emerge from his factor analytic studies are those which seem to be identifiable as evaluation, potency, and activity. In most of the reported studies the evaluative factor, i.e. (cognitive) has accounted for a large portion of the variance. He continues, "The similarities between the factors obtained from judging facial expressions and those obtained in our more general linguistic studies suggest that the latter also may have their grounding in the affective system. Let me speculate a bit further and suggest that the highly generalized nature of the affective reaction system--the fact that it is independent of any particular sensory modality and yet participates in all of them--is at once the mathematical reason why evaluation, potency, and activity tend to appear as dominant factors." He reports a study of synesthesia (visual-linguistic) which supports the above hypothesis. He also reports a study in which subjects were asked to rate (a cognitive task) personality variables. His results indicated that a common "theory" for describing personality was present.

Suppes, P. Mathematical Learning. On the behavioral foundations of mathematical concepts. Monogr. of the Soc. for Res. in Child Develpm., 1965, 30 (1), 60-95.

Suppes reports the development of a test instrument using a syllogistic form of reasoning for children ages six to eight. "There was a steady increase with age in the ability to draw correct logical inference from hypothetical premises . . . Six year old children, however, performed at quite a high level, in contradiction to the view of Piaget and his followers that such young children are limited to concrete operations."

Schachtel, E. G. On memory and childhood amnesia. In Mullaby, Patrick, ed. *A study of interpersonal relations*. New York: Hermitage, 1950.

Schachtel, in a very provocative essay written from the vantage point of Freudian psychology, discusses affect as a predecessor of logic and clarification as found in cognition. He discusses a very general type of synesthesia of taste, touch, and smell available to the infant.